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User's Guide to MOBILE2 (Mobile Source Emissions Model)

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This document is the User's Guide to MOBILE2. MOBILE2 is a computer program that calculates emission factors for hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) from highway motor vehicles. The program uses the calculation procedures and emission factors presented in Compilation of Air Pollutant Emission Factors: Highway Mobile Sources, March 1981 (EPA 460/3-81-005). MOBILE2 calculates emission factors for eight individual vehicle types in three regions of the country. MOBILE2 emission estimates depend on various ambient, vehicle usage, and local conditions such as temperature, speed, mileage accumulation and accrual distributions, vehicle-miles-traveled distributions, etc. MOBILE2 will estimate emission factors for any calendar year between 1970 and 2020, inclusive. The 20 most recent model years are considered in operation in each calendar year. MOBILE2 supercedes MOBILE1. Compared to MOBILE1, MOBILE2 incorporates several new options, calculating methodologies, emission factor estimates, emission control regulations, and internal program designs. As such, MOBILE2 should be easier to maintain, transport, alter and comprehend.

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USER'S GUIDE
TO
MOBILE2
(MOBILE SOURCE EMISSIONS MODEL)

FEBRUARY 1981

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DISCLAIMER

Within this final **MOBILE2 User's Guide,** there are references to a new AP-42 document, **Compilation of Air Pollutant Emission Factors: Highway Mobile Sources,** March 1981 (EPA 460/3-81-005). This AP-42 document along with further background documentation describing how the MOBILE2 emission factors were derived were not available at the time this manual was released. Once these emission factor documents are available, the EPA Regional Offices will be contacted and copies will be available through the National Technical Information Service in Springfield, Virginia.

Additionally, EPA will not be responsible for the accuracy of MOBILE2 tapes that were received from sources other than EPA in Ann Arbor or NTIS. Further, EPA will not be responsible for the accuracy of MOBILE2 when modified by the user.

ABSTRACT

This document is the USER'S GUIDE to MOBILE2. MOBILE2 is a computer program that calculates emission factors for hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) from highway motor vehicles. The program uses the calculation procedures and emission factors presented in Compilation of Air Pollutant Emission Factors: Highway Mobile Sources, March 1981 (EPA 460/3-81-005). MOBILE2 calculates emission factors for eight individual vehicle types in three regions of the country. MOBILE2 emission estimates depend on various ambient, vehicle usage, and local conditions such as temperature, speed, mileage accumulation and accrual distributions, vehicle-miles-traveled distributions, etc. MOBILE2 will estimate emission factors for any calendar year between 1970 and 2020, inclusive. The 20 most recent model years are considered in operation in each calendar year. MOBILE2 supercedes MOBILE1. Compared to MOBILE1, MOBILE2 incorporates several new options, calculating methodologies, emission factor estimates, emission control regulations, and internal program designs. As such, MOBILE2 should be easier to maintain, transport, alter, and comprehend.

Requests for copies of MOBILE2, for additional copies of this User's Guide, and for copies of AP-42, should be directed to the following:

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Chapter 1

GENERAL DESCRIPTION OF MOBILE2

1.0 INTRODUCTION

MOBILE2 is an integrated set of FORTRAN routines for use in the analysis of the air pollution impact of highway mobile sources. The system has been designed to provide the user with a flexible, yet easy to use, analytical tool which can be utilized in a wide variety of air pollution planning functions. MOBILE2 is an update of its predecessor MOBILE1.

This chapter gives an overview of MOBILE2; information it is based on, how it was developed, its general features, and how it differs from MOBILE1.

Explicit instructions on the usage of MOBILE2 are given in Chapter 2 (MOBILE2 Input), Chapter 3 (MOBILE2 Output), Chapter 4 (MOBILE2 Examples), and Chapter 5 (MOBILE2 Implementation and Possible Modifications). This manual also has three appendices which are included to facilitate the user in understanding and implementing the program: Appendix A (Internal Software Documentation) which describes the MOBILE2 variables and software modules, Appendix B (MOBILE2 Source Listing), and Appendix C (Program Errata).

1.1 MOBILE2 OVERVIEW

MOBILE2 began in the fall of 1978 when responsibility of developing highway mobile source emission factors was transferred to the Office of Mobile Source Air Pollution Control from the Office of Transportation and Land Use Policy. The first step in the sequence of events to develop MOBILE2 entailed becoming familiar with MOBILE1. This extensive review of MOBILE1 took place in the summer of 1979. Development of MOBILE2 emission factor estimates and calculating methodologies began in the Fall of 1979. In early 1980, MOBILE2 programming development began. MOBILE2 was created from MOBILE1; however, it had gone through 39 revisions before the released version of MOBILE2 was ready. The low altitude non-California emission factors were completed in July of 1980. These were released publicly in October of 1980, after incorporation of several regulation changes. In December of 1980, MOBILE2 was finalized. This final version included the emission factors for three MOBILE2 regions and I/M program credits. These MOBILE2 terms are explained in greater detail in Section 1.2.

MOBILE2 computes emissions from highway motor vehicles utilizing the most recent emission factors and calculating methodologies developed by the United States Environmental Protection Agency. These factors and the associated methodologies are published in the document *Compilation of Air Pollutant Emission Factors: Highway Mobile Sources*, March 1981 (EPA 460/3-81-005). This document is the latest in a series of supplements and appendices to AP-42, *Compilation of Air Pollutant Emission Factors*. For ease of reference, the March, 1981, document for highway mobile sources will hereafter be referred to as AP-42.

Although familiarity with the contents of AP-42 is not strictly required for the use of MOBILE2, the prospective user is strongly advised to read AP-42; as the unenlightened use of the program may produce results which, while mathematically correct, are nevertheless inappropriate for the particular application intended.

As explained in AP-42, MOBILE2 incorporates emission control regulations, emission data, and calculating methodologies not accurately reflected in MOBILE1. MOBILE2 incorporates the best information available at the time of its release.

1.2 MOBILE2 FEATURES

As mentioned previously, MOBILE2 is a FORTRAN computer model that estimates on-highway mobile source emissions. This section describes these on-highway mobile sources, the pollutants, and several other features available in MOBILE2.

1.2.1 The MOBILE2 Vehicle Types

Throughout this document, automobiles and light duty vehicles are considered synonymous. The vehicle types for which MOBILE2 calculates emissions are as follows:

Light Duty Gasoline Powered Vehicles (LDGV)

Light Duty Gasoline Powered Trucks with a gross vehicle weight (GVW) rating less than 6,001 lbs. (LDGT1)

Light Duty Gasoline Powered Trucks with a GVW rating between 6,001 and 8,500 lbs. (LDGT2)

Light Duty Gasoline Powered Trucks with a GVW rating less than 8,501 lbs. (LDGT)

Heavy Duty Gasoline Powered Vehicles (HDGV)

Light Duty Diesel Powered Vehicles (LDDV)

Light Duty Diesel Powered Trucks (LDDT)

Heavy Duty Diesel Powered Vehicles (HDDV)

Motorcycles (MC)

All Vehicle Types Combined (referred to interchangeably in the MOBILE2 output as ALL VEH, ALL MODES and C.E.F. ALL VEH)

The LDGT vehicle type is a vehicle-miles-traveled (VMT) weighted average of the LDGT1 and LDGT2 vehicle types. The "ALL VEH" vehicle type is a VMT weighted average of eight individual vehicle types: LDGV, LDGT1, LDGT2, HDGV, LDDV, LDDT, HDDV and MC.

1.2.2 The MOBILE2 Pollutants

The three pollutants for which MOBILE2 computes emission estimates are as follows:

hydrocarbons (HC)
carbon monoxide (CO)
oxides of nitrogen (NOx)

1.2.3 The MOBILE2 Regions

The MOBILE2 program computes emission estimates for three major regions:

Low Altitude (49-State or non-California) Regions
California (Low altitude) Regions
High Altitude (49-State or non-California) Regions

1.2.4 Calendar Years Allowed

MOBILE2 calculates emission estimates for January 1 of any calendar year 1970 through 2020. The emission estimate of each calendar year is composed of the 20 most recent model years.

1.2.5 Basic Exhaust Emission Rates

The basic exhaust emission rates included in MOBILE2 are generated from tests conducted on vehicles or engines under standardized test conditions representative of urban type driving. As such, the basic exhaust emission rates in MOBILE2 represent those standardized test conditions. These conditions for the different vehicle types are summarized in Table 1.2.5A and are given in specific detail in various Codes of Federal Regulations (CRF 40 Part 86, July 1, 1976, 1978, 1979, and 1980). As seen in Table 1.2.5A, MOBILE2 assumptions deviate somewhat from the test conditions. These deviations were required for ease of computations and have a minuscule impact.

Further, the MOBILE2 basic exhaust emission rates assume that 1) air conditioners are not in use, 2) vehicles are not towing trailers or carrying extra loads, 3) no I/M program is in effect, and 4) owners perform (or have performed) average maintenance on the vehicles.

1.2.6 Additional HC Emissions

MOBILE2 has three options specific to the calculation or output of HC emissions. The user can request MOBILE2 to calculate either total or non-methane HC emissions. In addition to the HC emissions MOBILE2 calculates (which include crankcase and evaporative HC emissions), MOBILE2 has the capability to output crankcase and evaporative HC emission factors for each vehicle type in units of gram/mile. The crankcase and evaporative HC emission levels depend upon miles per day and trips per day information. For each vehicle type, MOBILE2 has the option for the user to input miles per day and trips per day information representative of the particular area being analyzed.

1.2.7 Idle Exhaust Emission Rates

As an option, MOBILE2 can generate idle exhaust emission factors for the different vehicle types. These idle emission factors represent a vehicle in a hot stabilized condition and are given in units of grams per minute.

Table 1.2.5A
Basic Exhaust Emission Level
Standardized Test Conditions

	LDGV, LDGT1, & LDGT2	HDGV	LDDV & LDDT	HDDV	MC
Engine off period for cold start	12-36 hours	12+ hrs[1]	12-36 hours	12+ hrs [1]	6-36 hours[2]
Engine off period for hot start	10 minutes	20 minutes	10 minutes	20 minutes	10 minutes
Engine off Ambient Temperature	68-86°F	68-86°F	68-86°F	68-86°F	68-86°F
NOx Corrected to Ambient Humidity (grains of H_2O/lb. dry air)	75	75 N/A[3]	N/A	N/A	75
Average Trip Length	7.5 miles	6.5 miles	7.5 miles	6.4 miles	6.8-7.5 miles[2]
Average Trip Speed	19.6 mph	19.9 mph 20 mph[3]	19.6 mph	19.2 mph 20 mph[3]	17.8-19.6 mph[2] 19.6[3]
Average Idle Percent of Trip	18%	27%	18%	37%	18%
Average Percent VMT Cold Start	20.6%	14.3%	20.6%	14.3%	18.3-20.6%[2] 20.6[3]
Average Percent VMT Stabilized	52.1%	0%	52.1%	0%	52.1-57.5%[2] 52.1[3]
Average Percent VMT Hot Start	27.3%	86.7%	27.3%	86.7%	24.2-27.3%[2]. 27.3[3]

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[1] Optionally, this 12+ hour engine off time may be replaced by a forced cool down procedure, whereby cool water is circulated through the engine cooling system until the engine oil temperature is between 68°F and 75°F.

[2] Depending on engine size.

[3] Assumed in MOBILE2.

1.2.8 MOBILE2 Travel Fractions

To calculate the January 1 calendar year emissions for each vehicle type, MOBILE2 appropriately weights the 20 most recent model years together. These model year weights are known as the travel weighting fractions.

The travel weighting fractions for a given vehicle type are a distribution of the total VMT driven by the vehicle type apportioned among the 20 most recent model years. The travel fractions account for both the January 1 registration and fleet annual mileage accumulation rate distributions for the given vehicle type. Further, the expected increase in diesel sales by model year are taken into account for the light duty vehicle and truck fleets.

1.2.9 Speed/Temperature/Operating-Mode Correction Factors

Adjustments must be made to the basic exhaust emission levels to more accurately estimate vehicle emissions when the user attempts to model scenarios which do not conform to the basic test conditions given in Table 1.2.5A. Therefore, MOBILE2 computes and applies correction factors for speed, ambient temperature, and vehicle operating modes to reflect the scenarios the user is analyzing. (The operating modes are the percentage of the VMT driven by a vehicle type in a cold start, stabilized, and hot start condition). These correction factors are applied only to the basic exhaust emissions; not the crankcase and evaporative HC emissions or the idle emissions.

1.2.10 Additional Light Duty Correction Factors

As an option, MOBILE2 allows the user to include the effect of four "additional" correction factors for light duty gasoline powered vehicles and trucks.

These correction factors are segregated from those described in the previous section because they represent unique conditions which are often not assumed in MOBILE2 applications.

These four factors for light duty gasoline powered vehicles and trucks are as follows:

1) Air conditioning,
2) Extra load,
3) Trailer towing, and
4) NOx humidity (also applied to motorcycles).

These additional correction factors impact only the basic exhaust emission levels.

1.2.11 Credits for Inspection and Maintenance Programs

MOBILE2 allows the user to apply Inspection and Maintenance (I/M) credits to the basic exhaust emission levels. The emission reduction credits attributable to an I/M program vary according to the type of program in effect. The MOBILE2 I/M program credits depend upon the following six factors:

1) The estimated first year failure rate (stringency factor) for the pre-1981 low altitude non-California LDGVs (or other vehicle types with similar emission control technologies). The pre-1975 vehicles are defined as Technology I vehicles and 1975-1980 vehicles are defined as Technology II vehicles.

2) The success rate in identifying 1981 and later model year low altitude non-California LDGVs operating under rich failure conditions (the identification rate of Technology IV vehicles). Technology III is not defined in MOBILE2 .

3) The vehicle types affected by the program: LDGV; LDGV & LDGT1; LDGV & LDGT2; or LDGV, LDGT1, & LDGT2.

4) The calendar year being analyzed and the calendar year an I/M program is implemented.

5) The presence or absence of an adequate mechanics training program.

6) The model years involved in the I/M program.

1.3 DIFFERENCES BETWEEN MOBILE2 AND MOBILE1

MOBILE2 operates in a manner similar to MOBILE1. MOBILE2 was designed to maintain input/output sequences that are as much as possible like the previous model. MOBILE2 has several new options. Thus, most of the differences between MOBILE2 and MOBILE1 are the result of including the additional options. This section describes the most important differences between MOBILE2 and MOBILE1. These differences fall into three general categories: input, output, and internal.

1.3.1 Data Input Differences

Both MOBILE1 and MOBILE2 have three input sections. These sections are mentioned here, but are defined in detail in Chapter 2. The three sections are the CONTROL, ONE-TIME DATA and PARAMETER.

The CONTROL Section of MOBILE2 which impacts the input of data and output of information, has been changed in 12 places as compared to MOBILE1. Nine of these changes are a result of additional options available in MOBILE2. The remaining three changes are a result of eliminating MOBILE1 options.

The three MOBILE1 options that are no longer available are the free format (list-directed) input, the three speed input option, and the unformatted output reports. These options were deleted from MOBILE2 because of problems or confusion that arose with MOBILE1. Although these options are not available in the released MOBILE2 version, they can be easily reinstated. The procedures required to reinstate the three options are outlined in Chapter 5.

The new nine options in MOBILE2 that are not available in MOBILE1 are discussed below.

MOBILE2 permits a user to input the CONTROL Section information on three records as an alternative to the MOBILE1 16 record CONTROL Section. MOBILE2 also permits a user to define in the CONTROL Section the output units where the formatted reports, diagnostic messages, and prompting messages are to be placed. Further, MOBILE2 has three new output formats that can be selected in the CONTROL Section.

In the ONE-TIME DATA Section, three additional input options are available. One record which defines the type of I/M program also enables the user to change the basic MOBILE2 I/M vehicle types, identification rate, and credits. Another option results from the use of the additional correction factors which also permits the individual input of trailer towing fractions for the LDGTs, and the dry and wet bulb temperatures for the air conditioning usage fraction. The third additional option permits the user to define the trips per day and miles per day characteristics for each vehicle type.

The last input option available in MOBILE2 (that was not possible with MOBILE1) is the input of eight speed values in the PARAMETER Section. This option permits the user to define the average speed for each of the eight vehicle types referred to in Section 1.2.1.

One final area (where MOBILE2 differs from MOBILE1) which impacts the input of data is the addition of two new vehicle types in MOBILE2: LDDVs and LDDTs. Because of these additional vehicle types, MOBILE1 input streams may not be interchangeable with MOBILE2 input streams. If a user wants to define the VMT mix, the registration distribution, or the mileage accrual distribution in MOBILE2; the MOBILE1 input streams must be altered to include the information for the two new vehicle types. Further information on this topic is given in Chapter 2.

1.3.2 Output Differences

Both MOBILE2 and MOBILE1 have three distinct output sections. The sections are discussed briefly here, but are described in detail in Chapter 3. The three sections are reports of emission estimates, diagnostic messages, and prompting messages. As mentioned in Section 1.3.1, MOBILE2 has the option to control the unit to which the output sections are written; MOBILE1 does not have this capability.

There are four output report differences between MOBILE2 and MOBILE1. Three of the differences result from the three additional MOBILE2 report options. The fourth difference is with the unformatted reports. MOBILE2 does not have the unformatted report option, but it could be easily reinstated as explained in Chapter 5.

The three additional output report options in MOBILE2 are different from the MOBILE1 format reports in that LDDV, LDDT, and LDGT emissions are displayed.

When input data problems occur, MOBILE2 will assist users in the identification of the problems with diagnostic messages. The diagnostic messages generated by MOBILE2 are significantly improved over those in

MOBILE1. MOBILE2 has two basic types of diagnostic messages: error and warning messages. Since MOBILE2 (unlike MOBILE1) verifies all input values against allowable limits, MOBILE2 produces diagnostic messages whenever a dubious input value is encountered. Further, depending on the nature of the questionable data, MOBILE2 either prints an error or warning message. An error will always result in the termination of MOBILE2. A warning message is intended to draw the user's attention to some characteristic of the conditions being modeled, in order that the user may determine whether the conditions are those intended. A warning will not terminate MOBILE2.

For users uncertain of the order of the input data, prompting messages are an option. The prompting messages in MOBILE2 differ from those in MOBILE1 primarily because additional options are available in MOBILE2. MOBILE1 does not prompt for every input requirement, whereas MOBILE2 prompts for every input requirement. The prompting exception to both programs is that neither prompts for the first record.

1.3.3 Internal Program Differences

Internally, MOBILE2 is significantly different from MOBILE1. As a result of the differences, MOBILE2, compared to MOBILE1, should be more user oriented, more flexible to use, easier to maintain, easier to transport from one machine to another, and easier to understand. There are other internal changes in MOBILE2 besides its flexibility, maintainability, and transportability where it is improved over MOBILE1. MOBILE2 is expanded in two areas and has calculation methodology changes in six areas compared to MOBILE1.

A few general aspects that improve the MOBILE2's flexibility, maintainability, and transportability are as follows: MOBILE2 has more documentation included in the program, MOBILE2 is more structured than MOBILE1, and MOBILE2 is closer to ANSI FORTRAN standards. Also, MOBILE2 internally uses four digit calendar and model year values as opposed to the MOBILE1 index system.

The two areas referenced above where MOBILE2 is improved over MOBILE1 are the expanded range of calendar years for which emission factors can be calculated and the maximum number of emission rates possible for any given pollutant/vehicle-type/region combination. MOBILE2 calculates emission factors for any calendar year between 1970 and 2020, inclusive. MOBILE1 calculates emission factors only through 1995. Also, MOBILE2 permits up to 15 emission rates per pollutant/vehicle-type/region combination, whereas MOBILE1 permits up to 10.

MOBILE2 calculation procedures differ from MOBILE1 procedures primarily in six areas: 1) MOBILE2 separates the MOBILE1 crankcase and evaporative HC emissions into components (crankcase, diurnal, and hot soak losses), 2) MOBILE2 calculates emissions on a January 1 date as opposed to July 1, 3) the speed correction factor is applied to the entire trip cycle as opposed to the three operating modes, 4) temperature effects are evident on all three pollutants and operating modes in MOBILE2 as opposed to MOBILE1 where only HC and CO on the cold start mode are affected, 5) the MOBILE2 air conditioning usage is a function of a discomfort index as opposed to the user-estimated MOBILE1 input, and 6) no HDV power to displacement correction factor is calculated or applied in MOBILE2.

As mentioned above, MOBILE2 is more structured than MOBILE1. To illustrate how the MOBILE2 structure differs from the MOBILE1 structure, each MOBILE1 subprogram is matched to its MOBILE2 counterparts. This correspondence is made in Table 1.3.3A. As can be seen in this table, there are significant differences in the structures of MOBILE2 and MOBILE1.

One last difference between MOBILE2 and MOBILE1 is the inclusion of all common areas in the MOBILE2 "MAIN" program. All common areas are not included in the MOBILE1 "MAIN" program.

Table 1.3.3A
MOBILE1 to MOBILE2 Subprogram Correspondence

MOBILE1 Subprogram	MOBILE2 Analogous Subprogram(s)
MAIN	MAIN, BD13[1], BD21
INPUT	INPUT, QUITER, NEWDAT, YRTEST, CCEVAX
OUTPUT	OUTPUT; OUTHD0,1,2,3,4; OUTDT0,1,2,3,4; OUTPOL; OUTIMP; OUTALT; OUTMTH; OUTHDR
EFCALX	EFCALX
BIGCFX	BIGCFX, BD14, BD15, ISSPTR, ISPPT8, BD17, IGPPRT, BD16
INITEX	--
TFCALX	REGMOD, TFCALX, IGSFPT, BD20
SPFCLX	SPFCLX
BEFGEN	BEF, BEFIDL, BD7, IEXMPT
GETCUM	GETCUM
EFALTX	EFALTX
CCEVAX	CCEVRT; HOTSOK, BD8, TPD, BD9, DIURNL, BD10, XMPD, BD11, CRANKC, BD12
LDVIMX	PCLEFT
ALUH	ALUH, BD18, IGEPTR, BD19, IGUPTR, IGLPTR,IGTPTR
TRKOPC	--
BDSPD	BD1
BDMYMR	BD2
BDE123	INDX3R, BD3, BD4
BDI123	BD5
BDIM	BD6

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[1] Note: MOBILE1 and MOBILE2 routine names beginning with "BD" refer to BLOCK DATA modules.

Chapter 2

MOBILE2 INPUT

2.0 INTRODUCTION

The reader is strongly encouraged to refer to the examples in Chapter 4 when reading this chapter. The examples illustrate the use of MOBILE2's options and data input requirements.

MOBILE2 utilizes one input data set that supplies program control information and the data describing the scenarios for which emission factors are to be calculated. The input data set consists of three distinct sections: The CONTROL Section, the ONE-TIME DATA Section and the PARAMETER Section.

The CONTROL Section is the part of the MOBILE2 input data that controls the input, output and execution of MOBILE2. For example, the CONTROL Section indicates if MOBILE2 will prompt for input, or analyze an emission factor scenario with an inspection/maintenance program, or analyze only non-methane hydrocarbons, or output the emission factors in a format suitable for visual analysis, etc.

Certain parameters used in MOBILE2 calculations have internal default values. The ONE-TIME DATA Section is the part of the MOBILE2 input data set that allows the user to define parameter values different from those assumed in MOBILE2 which will be used in the calculations of all applicable emission factor scenarios. For example, in the ONE-TIME DATA Section the vehicle-miles-traveled (VMT) mix, registration distributions, and fleet mileage accumulation distributions can all be altered.

The PARAMETER Section is the part of the MOBILE2 input data set which further describes the emission factor scenario being analyzed. For example, the PARAMETER Section data includes the region of the country, calendar year, speed, temperature, and possibly a specific VMT mix or additional correction factors being studied in the current analysis.

These three sections are described in greater detail in the remainder of this chapter.

2.1 CONTROL SECTION

The CONTROL Section consists of 16 fields which are used for program control. The values for the fields will be explained in later subsections. The CONTROL Section is composed of two subsections: 1) Input and execution flags and 2) flags controlling output.

These 16 fields are referred to as FLAGS. With the exception of the first and second fields, each flag contains a single digit value. These flags are read in one of two input formats. The first format consists of one field per record (I1,3A1/20A4/14(I1/)). The second consists of one field per record for the first two records but the remaining 14 single digit fields are read from the third record (I1,3A1/20A4/14(I1,1X)).

Each record of the CONTROL Section is required.

2.1.1 Input and Execution Flags

Records one through ten of the CONTROL Section are the input and execution flags. These flags primarily control the input formats and data requirements of MOBILE2. These ten factors are described below:

Record No. 1: IPROMT (controls input format and prompting)
IOUNEW (controls output unit numbers)

The Record No. 1 format is (I1, 3A1).

The flag IPROMT controls two aspects of the input: 1) whether the user wants prompting messages for interactive runs and 2) the arrangement of input flags 3 through 16. The user may choose to enter these 14 input flags on individual records (vertical format) or on one record (horizontal format). MOBILE1 used only the vertical type of input format.

IPROMT should be set equal to 0 or 1 if the user desires vertical input. Alternatively it should be set to 2 or 3 if the user desires horizontal input. Setting IPROMT equal to 1 or 3 will make MOBILE2 print prompting messages for the input; otherwise no prompting messages will appear. It is suggested that a prompting option be used only if the user is uncertain of the order of the input data. The IPROMT codes are summarized in the following table:

IPROMT	Format	Prompting	See Example
0	vertical	no	1, 3, or 7
1	vertical	yes	4, 6, or 8
2	horizontal	no	2
3	horizontal	yes	5

The fields of IOUNEW on this first record control the unit devices designated for the various types of MOBILE2 output. There are three types of output: 1) the estimated emissions reports, 2) diagnostic messages, and 3) prompting messages. MOBILE2 allows the user to specify separate output unit devices for each type of output. MOBILE1 output was automatically directed to a single output file. The MOBILE2 output units are specified by three fields in IOUNEW as indicated below. If no values are entered for the three fields, MOBILE2 will direct all output to unit 6.

IOUNEW Field	Default Unit	Unit Contents
1	6	Formatted report output
2	6	Diagnostic messages
3	6	Prompting messages

Values of 1, 2, 3, 6, 7 and 8 are allowed by MOBILE2 for any IOUNEW value. Values 4 and 5 are reserved as input device codes in MOBILE2 and may not be used for any IOUNEW value. If an illegal or missing IOUNEW value is encountered, MOBILE2 will revert to that unit's default value. However, the user is warned that IOUNEW values considered valid for MOBILE2 may not be appropriate for a given machine. All of the examples in Chapter 4 illustrate some aspect of the IPROMT flag with the IOUNEW fields.

Record No. 2: PROJID (output title)

The Record No. 2 format is 20A4.

This record is printed at the top of the formatted emission output report. The user may use up to 80 columns. The character string entered on this record need not be left-justified. If the user does not want a title, a blank record must be entered. See the examples in Chapter 4.

Record No. 3: INFLAG (controls READ statements)

The Record No. 3 format is I1.

INFLAG indicates the type of FORTRAN READ statement used by MOBILE2. The value of 1 for this flag is used to perform all reads using the regular FORTRAN fixed format. MOBILE1 had the option of list directed input. This option has been eliminated from MOBILE2, but the flag is retained to employ the MOBILE1 input sequence. See the example in Chapter 4.

Record No. 4: SPDFLG (controls speed inputs)

The Record No. 4 format is I1.

SPDFLG is used to indicate whether the speed input in the PARAMETER Section contains one average speed for all vehicle types or eight different speeds; one for each vehicle type. Accordingly, the values for this flag are either 0 or 2. See Example 5 in Chapter 4 for the eight speed input option.

Record No. 5: VMFLAG (controls VMT inputs)

The Record No. 5 format is I1.

VMFLAG is used to indicate whether the user is entering an estimated vehicle-miles-traveled (VMT) mix or is using the VMT mix calculated by MOBILE2. The VMT mix consists of a series of fractions that represent the portion of the total VMT which is attributable to each of the eight vehicle categories. The valid range of values for this flag are the integer values of 0 through 2. See Examples 4 and 5 in Chapter 4. If VMFLAG equals 0 the user takes no further action. If VMFLAG equals 1 the user supplied VMT mixes are placed in the PARAMETER Section. If VMFLAG equals 2 the user supplied VMT mix is placed in the ONE-TIME DATA Section.

Record No. 6: MYMRFG (controls annual mileage accumulation rate and registration inputs)

The Record No. 6 format is I1.

MYMRFG is used to indicate whether the user is entering estimated vehicle registration and/or annual mileage accrual rate distributions or using the MOBILE2 distributions. See Examples 4, 5 and 6 in Chapter 4. The data requirements of this flag are placed in the ONE-TIME DATA Section. The values that are valid for the MYMRFG flag are 0, 1, 2, and 3. If MYMRFG = 0, then no further action is taken by the user. If MYMRFG = 1, 2, or 3; then the user must supply the registration distributions, the annual mileage accrual distributions, or both distribution sets; respectively.

Record No. 7: ALTFLG (controls alternative basic exhaust emission rate inputs)

The Record No. 7 format is I1.

ALTFLG is used to indicate whether the user will modify any of the basic exhaust emission rates used in the program. The possible input values are 0 and 1. These values correspond to the use of the internal MOBILE2 emission rates or user supplied set of modified emission rates, respectively. The data requirements for this flag are placed in the ONE-TIME DATA Section.

Changes to the idle exhaust emission rates are not allowed with the use of the ALTFLG. In fact, if the ALTFLG is employed to modify the basic exhaust emission rates, the idle emission rates that correspond to the altered pollutant, region, and vehicle-type will be zeroed. The idle exhaust emission rates are assigned zero values to avoid possible misinterpretation that might accompany the normal output of idle emission factors (controlled by the IDLFLG flag; record No. 14). Since the basic exhaust emission rates change, it is likely that the idle emission rates would also change. However, the exact magnitude of the idle rate change is unknown and therefore is not modeled in MOBILE2. Rather than output the unmodified idle emission rates, MOBILE2 will output zero values. See Example 2, 5 and 7 in Chapter 4.

Record No. 8: IMFLG (controls I/M credit inputs and usage)

The Record No. 8 format is I1.

IMFLG is used to indicate whether the computed emission factors should include credits for an Inspection and Maintenance (I/M) program. With this flag the user may also indicate whether or not to alter any of the following: the vehicle types affected by I/M, the Technology IV identification rate, or the MOBILE2 I/M credits. See Examples 2, 5, and 6 in Chapter 4. The IMFLG flag has valid values of 0, 1, and 2. These values correspond to a situation without an I/M program, a default MOBILE2 type I/M program, and a user modified I/M program; respectively. The data requirements for this flag are placed in the ONE-TIME DATA Section and, if applicable, on input device unit 4. See Section 2.2.4 for additional information.

Record No. 9: ALHFLG (controls the inputs and usage of additional LD correction factors)

The Record No. 9 format is I1.

ALHFLG is used to indicate whether the emission factor computation should include the effects of the four "additional" correction factors for light duty gasoline powered vehicles and trucks.

The meanings of the ALHFLG values are summarized below:

ALHFLG = 0 This value indicates that the user does not wish to apply the "additional" correction factors.

ALHFLG = 1 This value indicates the use of the correction factors. In this case the user supplies
1 air conditioning use factor;
3 extra load usage fractions (LDGV, LDGT1, LDGT2);
1 trailer towing fraction; and
1 humidity level.

ALHFLG = 2 This value indicates the use of the correction factors. The user must supply
1 air conditioning use factor;
3 extra load usage fractions (LDGV, LDGT1, LDGT2);
3 trailer towing usage fractions (LDGV, LDGT1, LDGT2);
1 humidity level;
1 dry bulb temperature (used in calculation of the frequency of air conditioner usage); and
1 wet bulb temperature (used in calculation of the frequency of air conditioner usage).

The first two assignments of the ALHFLG flag are used in MOBILE2 as they were in MOBILE1. The third value of the ALHFLG (ALHFLG=2) has been added to MOBILE2 to calculate the air conditioning usage rate as a function of ambient conditions (the dry and wet bulb temperatures).

If ALHFLG is equal to 1 or 2 each of the four correction factors is always applied to all three light duty gasoline powered vehicle and truck types: LDGV, LDGT1, and LDGT2. For motorcycles, only the humidity correction is applied. None of these emission corrections are applied to heavy duty vehicles or diesel vehicles. See Examples 4, 5 and 8 in Chapter 4. The ALHFLG flag's data requirements must be placed in the PARAMETER Section.

Record No. 10: TRKFLG (used only to maintain MOBILE1 input data sequence)

The Record No. 10 format is I1.

In MOBILE1, TRKFLG indicated whether the emission factor computation for heavy duty vehicles included the effect of the 'additional' correction factor based on the power/weight ratios of these vehicles. This correction factor is no longer used. However, users must still submit this record to preserve sequence compatibility with MOBILE1 input data. If TRKFLG is set to 1, one line of dummy data must be entered in the PARAMETER Section for each scenario to preserve the MOBILE1 record sequence. The dummy data record may contain anything and will be ignored. It is recommended that the user set the TRKFLG flag to 0 so no data will be required in the PARAMETER Section. See Example 1 in Chapter 4.

Table 2.1.1A briefly describes the flags which control the input and execution of the MOBILE2 program.

2.1.2 Flags Controlling Output

Records 11 through 16 of the input stream consist of a series of flags that primarily control the form and content of the output from MOBILE2. These records are described below:

Record No. 11: IFORM (controls output format)

The Record No. 11 format is I1.

The flag IFORM indicates the structure of the formatted output which is to be printed. The user may select an output data set that is primarily numeric and therefore suitable for use as input to another program or an output data set that is more suitable to visual analysis (descriptive). Additionally, through the IFORM flag, the user selects which of the vehicle types will be listed individually in the output. The user has two options for the output of emissions by vehicle type: 1) output includes LDGV, LDGT1, LDGT2, HDGV, HDDV, MC and ALL vehicle emissions combined or 2) it includes all of the above plus LDDV, LDDT, and combined LDGTs. In either case, the emission levels of the ALL vehicle combined category are the VMT weighted combination of eight vehicle types: LDGV, LDGT1, LDGT2, HDGV, LDDV, LDDT, HDDV and MC. A description of the output structure associated with each value of the IFORM flag is given below. Included in the description is the column width of the report.

IFORM	Structure of Output	See Example
0	Numeric; seven vehicle types in 132 columns	1
1	Descriptive; seven vehicle types in 80 columns	2 or 8
2	Numeric; ten vehicle types in 80 columns	3
3	Descriptive; ten vehicle types in 112 columns	4, 6, or 7
4	Descriptive; ten vehicle types in 80 columns	5

Record No. 12: PRTFLG (controls pollutant output)

The Record No. 12 format is I1.

Table 2.1.1A
FLAGS CONTROLLING INPUT AND EXECUTION

Record No	Variable Name	Description	Format	Value ----- ACTION
1	IPROMT	Flag for prompting of input	I1,3A1	0XYZ - No prompting; vertical format. 1XYZ - Program prompts for input; vertical format. 2XYZ - No prompting; horizontal format. 3XYZ - Program prompts for input; horizontal format.
	IOUNEW	Values for output units as follows: 1) X = Formatted reports unit. 2) Y = Diagnostic messages unit. 3) Z = Prompting messages unit.		
2	PROJID	80 characters for title used as output header.	20A4	--------
3	INFLAG	Indicates formatted READ	I1	1 - Formatted READ
4	SPDFLG	Selects speeds for each vehicle type.	I1	0 - Input one speed for all vehicle types.[1] 2 - Input eight speeds; one for each vehicle type.[1]
5	VMFLAG	Selects optional use of user supplied VMT mix among vehicle types.	I1	0 - Use MOBILE2 VMT mix. 1 - User supplies VMT mix for each scenario.[1] 2 - User supplies one VMT mix for all scenarios.[2]
6	MYMRFG	Flag for optional input of registration and/or mileage accrual distributions.	I1	0 - Use MOBILE2 registration and mileage accumulation distributions. 1 - User supplies mileage accumulation distributions.[2] 2 - User supplies registration distributions.[2] 3 - User supplies both distributions for all vehicle types.[2]
7	ALTFLG	Flag for optional modification of basic exhaust emission rates by model year.	I1	0 - Use MOBILE2 exhaust emission rates. 1 - User modifies the basic exhaust emission rates.[2]

Table 2.1.1A Continued

8	IMFLG	Flag to include impact of I/M program in calculations.	I1	0 - No I/M program. 1 - MOBILE2 supplied I/M credits.[2] 2 - User modifies the MOBILE2 I/M program.[2]
9	ALHFLG	Flags optional use of four special correction factors: a) air conditioning; b) vehicle load; c)trailer towing; d) humidity(NOx only).	I1	0 - No input values required. 1 - Six input values required.[1] 2 - Ten input values required.[1]
10	TRKFLG	Non-functional flag used to maintain MOBILE1 input sequence.	I1	0 - No further information is required. 1 - An addition line is required.[1]

---

[1] Input data must be placed in the PARAMETER Section.
[2] Input data must be placed in the ONE-TIME DATA Section.

PRTFLG is used to indicate which pollutants are to be printed on the formatted output reports. If PRTFLG = 0, the emission factors are printed for all three pollutants: HC, CO and NOx. If PRTFLG = 1, only HC emissions are printed. If PRTFLG = 2, only CO emissions are printed. If PRTFLG = 3, only NOx emissions are printed. See Examples 6, 7, and 8 in Chapter 4.

Record No 13: ICEVFG (controls crankcase and evaporative HC input and output)

The Record No. 13 format is I1.

ICEVFG is used to indicate 1) whether the user wishes to enter trips per day and miles per day information different than those in MOBILE2 and 2) whether the user wants separate total crankcase and evaporative HC emission factors to be printed. The HC emission factors printed in the reports will always include the crankcase and evaporative HC emission levels.

ICEVFG has four possible values that indicate the following:

ICEVFG = 0
a. No user input of trips per day and miles per day.
b. No additional crankcase and evaporative HC emission line printed. See Examples 6 and 8 in Chapter 4.

ICEVFG = 1
a. No user input of trips per day and miles per day.
b. An additional crankcase and evaporative HC line printed. See Examples 1, 2, or 4 in Chapter 4.

ICEVFG = 2
a. User supplies trips per day and miles per day.
b. No additional crankcase and evaporative HC line printed. See Example 7 in Chapter 4.

ICEVFG = 3
a. User supplies trips per day and miles per day.
b. An additional crankcase and evaporative HC line printed. See Examples 3 or 5 in Chapter 4.

If ICEVFG equals two or three then the trips per day and miles per day information must be entered in the ONE-TIME DATA Section.

Record No. 14: IDLFLG (controls output of idle emission factors)

The Record No. 14 format is I1.

IDLFLG is used to indicate whether or not idle emission factors representing hot stabilized engine conditions are to be printed in addition to the basic emission factors. If IDLFLG = 1, this option is invoked. If IDLFLG=0, only the basic emission factors are printed. See Examples 2, 4, 5, and 8 in Chapter 4.

Record No. 15: NMHFLG (controls output of total or non-methane HC emissions)

The Record No. 15 format is I1.

NMHFLG is used to indicate whether total or non-methane HC emission factors are to be generated and printed. If NMHFLG = 0, total HC emissions are calculated and printed. If NMHFLG = 1, non-methane HC emissions are calculated and printed. See Examples 2, 4, 5, and 8 in Chapter 4.

Record No. 16: UNFFLG (used to maintain MOBILE1 input data sequence)

The Record No. 16 format is I1.

The flag UNFFLG is non-functional in MOBILE2. UNFFLG was used in MOBILE1 to indicate whether the user desired an unformatted output data set to be generated in addition to the formatted output data set. MOBILE2 provides only formatted output reports. UNFFLG should always be set equal to zero. See the examples in in Chapter 4.

Table 2.1.2A briefly describes the flags which control the MOBILE2 output.

2.2 ONE-TIME DATA SECTION

The ONE-TIME DATA Section contains information which, as the name implies, is input only once to MOBILE2. This input information is used to alter the internal MOBILE2 estimates to be locality dependent. For example, a user can incorporate in this ONE-TIME DATA Section VMT, mileage accural and/or registration distributions that are specific to the area of concern. These records are optional; their use being dictated by the values of some of the flags in the CONTROL Section. If any of these records are included in the input, they follow immediately after the CONTROL Section in the order in which they are described below.

The ONE-TIME DATA Section will be included if one or more of the following MOBILE2 options is selected:

1. The user wishes to supply a VMT mix which will be applied to all emission factor calculations (VMFLAG=2).
2. The user wishes to use local mileage accumulation and/or registration distributions (MYMRFG=1, 2, or 3).
3. The user wishes to modify the basic exhaust emission rates used in the calculation of the emission estimates (ALTFLG=1).
4. The user wishes to include Inspection/Maintenance credits in the emission factor calculations (IMFLG=1 or 2).
5. The user wishes to modify the average number of trips per day and miles per day for the calculation of evaporative HC emissions (ICEVFG=2 or 3).

In the ONE-TIME DATA Section, the data requirement order is the same order as the associated flags in the CONTROL Section.

TABLE 2.1.2A
FLAGS CONTROLLING OUTPUT

Record No	Variable Name	Description	Format	Value ------- ACTION
11	IFORM	Selects the structure of formatted output report. All output structures list emissions for LDGV, LDGT1 LDGT2, HDGV, HDDV, MC and ALL vehicle emissions combined.	I1	0 - Numeric output (same as MOBILE1). 1 - Descriptive output (same as MOBILE1). 2 - Numeric output; emissions additionally listed for the LDDV, LDDT and combined LDGT vehicle types. 3 - Descriptive output in 112 columns; emissions additionally listed for the LDDV, LDDT and combined LDGT vehicle types. 4 - Descriptive output in 80 columns; emissions additionally listed for the LDDV, LDDT and combined LDGT vehicle types.
12	PRTFLG	Selects which pollutants are included in output.	I1	0 - HC, CO, and NOx. 1 - HC only. 2 - CO only. 3 - NOx only.
13	ICEVFG	Controls user input of trips/days and miles/day and additional listing of crankcase and evaporative HC emissions.	I1	0 - No user input; no additional input. 1 - No user input; additional output. 2 - User inputs[1]; no additional output. 3 - User inputs[1]; additional output.
14	IDLFLG	Controls output of idle emission factors.	I1	0 - No idle output. 1 - Output idle emission factors.
15	NMHFLG	Selects total or non-methane HC calculations and output.	I1	0 - Total HC. 1 - Non-methane HC.

Table 2.1.2A (Continued)

16	UNFFLG	Flag no longer used except to maintain MOBILE1 input record sequencing.	I1	0 - Formatted output.

---

[1] Data requirements must be placed in the ONE-TIME DATA Section.

2.2.1 One-Time VMT Mix

If VMFLAG (Record No. 5) has the value 2, this record is required. It contains the VMT mix that the user wishes to use. The record has the format 8F4.3, where the eight values are the fractions of the total VMT attributable to each of the eight vehicle types. The VMT fractions are entered in the following order: LDGV, LDGT1, LDGT2, HDGV, LDDV, LDDT, HDDV and MC. The eight fractions should sum to 1.0. See Example 5 in Chapter 4.

If a different VMT mix is desired for each scenario or calendar year, the VMFLAG should be assigned the value 1, and the VMT mixes should be entered in the PARAMETER Section as described in Section 2.3.2.

2.2.2 Mileage and Registration Distributions

If MYMRFG (Record No. 6) has any of the values 1, 2, or 3, this group of records is required. Depending upon which of the MYMRFG values is assigned, the user must enter annual mileage accrual data, vehicle registration data, or both. Each of these distributions is entered on 16 records, two records for each vehicle type, 10 years per record. The order of vehicle types is LDGV, LDGT1, LDGT2, HDGV, LDDV, LDDT, HDDV and MC. The format of each record is 10F5.3.

If MYMRFG = 1, the user must input the distribution of annual mileage accrual rates for each of the eight vehicle types. As mentioned above, the annual mileage accrual rates must be entered on 16 records; two for each vehicle type. Further, the annual mileage accrual rates must be divided by 100,000 miles. The first record of each vehicle type must contain the annual rates of mileage accrual expressed in units of one hundred thousand miles for model year indices 1 through 10. The second record of each vehicle type must contain the same information for model year indices 11 through 20+.

If MYMRFG = 2, the user must input the July 1 vehicle registration distributions for each of the eight vehicle types. These registration distributions must be entered on 16 records; two for each vehicle type. The first record of each vehicle type must contain the registration distribution for model year indices 1 through 10. The second record of each vehicle type must contain the same information for model year indices 11 through 20+. The 20 registration fractions for each vehicle type should sum to 1.

IF MYMRFG = 3, the user must input both of the above distributions for each vehicle type. For this situation, the entire set of 16 annual mileage accumulation rate records precedes the 16 registration distribution records.

If the MYMRFG flag is set to 1, 2, or 3; the mileage and/or registration data for all eight vehicle types must be entered. If the user wishes to input local data for fewer than the eight vehicle types, then the local data (for the fewer number of vehicle types) must be supplemented with the data listed in the BLOCK DATA 2 subroutine. Further, the LDGV and LDDV registration distributions must equal each other for all 20 years.

If they are not equal, MOBILE2 will produce an error message and the program will terminate. The registrations of the LDGV and LDDV vehicle types are grouped into one light duty vehicle (LDV) fleet. From this combined LDV fleet, MOBILE2 separates the registrations of the diesel powered from the gasoline powered vehicles by using the fleet sales fractions (i.e., dieselization rates). Similarly, the LDGT1 and LDDT registration distributions must be equal. No similar restrictions are placed on the mileage accrual distributions. See Examples 4, 5, and 6 in Chapter 4.

2.2.3 Emission Factor Modification Data

If ALTFLG (Record No. 7) has the value 1, the user is required to input information describing how the basic emission rates are to be modified. This option requires the user to input two types of records. The first type consists of a single field which specifies the number of basic exhaust emission rates that will be altered. An I2 format is used for this first record. This record is immediately followed by a number of records equal to that specified on the first record. Each record of the second type contains the following information (the valid range of each integer field is given in parenthesis):

1. Region code (1: Low altitude non-California, 2: California, and 3: High altitude non-California).
2. Vehicle type code (1: LDGV, 2: LDGT1, 3: LDGT2, 4: HDGV, 5: LDDV, 6: LDDT, 7: HDDV, and 8: MC).
3. Pollutant code (1: HC, 2: CO, and 3: NOx).
4. First model year for which factors are to be modified (51-99, 00-20; the last two digits of the model year).
5. Last model year for which factors are to be modified (51-99, 00-20, but not less than the value in item 4 after conversion to a four-digit year).
6. User specified zero mile emission level.
7. User specified emission deterioration rate.

The format of this type of record is 3(I1,1X), 2(I2,1X), F6.2, 1X, F6.2.

Current program dimensions allow up to 15 basic emission rates (model year groups) to be used for a given pollutant/region/vehicle-type combination. The original equations incorporated within MOBILE2 take up some of the 15 spaces. Users may enter alternative emission equations into the remaining spaces. The number of alternative equations that can be entered for any pollutant/region/vehicle-type combination is therefore 15 minus the original number. The maximum number of alternative equations are given in Table 2.2.3A. If the user specifies a number of alternative equations which exceeds the allowed dimensions, MOBILE2 will not process the run stream since incorrect calculations would result. MOBILE2 will identify all of the equations that exceed the allowed dimensions. See Examples 2, 5,and 7, in Chapter 4.

Table 2.2.3A
NUMBER OF ALTERNATIVE EQUATIONS THAT CAN BE ENTERED IN MOBILE2 BY POLLUTANT, REGION (LOW ALTITUDE/CALIFORNIA/HIGH ALTITUDE), AND VEHICLE TYPE

Vehicle Type	HC	CO	NOx
LDGV	7/5/3	6/5/3	8/6/4
LDGT1	5/4/2	5/5/2	7/7/4
LDGT2	7/6/6	7/6/6	8/6/7
HDGV	9/7/9	9/7/9	9/7/9
LDDV	9/8/7	9/8/7	7/8/7
LDDT	11/12/11	11/12/11	11/11/11
HDDV	13/13/13	13/13/13	13/11/13
MC	12/10/12	12/10/12	12/10/12

2.2.4 Inspection/Maintenance Data

If IMFLG (Record No. 8) has the value 1, the user must input one record describing several Inspection/Maintenance program parameters. The five required parameters are listed below followed by allowable ranges in parentheses:

1. Last two digits of year of I/M program implementation (70-99, 00-20).
2. Stringency level of I/M program (10-50).
3. Mechanic training flag (IMTFLG), indicating whether mechanic training is an integral part of the I/M program (0-No/1-Yes).
4. Earliest model year included in I/M program (51-99, 00-20).
5. Latest model year to be included in the I/M program (51-99, 00-20, but not earlier than value in item 4).

The last two items give the user the capability of excluding a specified range of model years from the I/M program. If all years are included in the program, the last two items should be given the values 51 and 20; respectively.

The format of this record is I2,1X,I2,1X,I1,1X,I2,1X,I2. The I/M credits incorporated into the emission factors under this option assume an annual January 1 inspection cycle.

If IMFLG has the value of 2, the information above plus three additional values must be given. The three additional pieces of information are as follows:

6. The type of vehicles to be affected by I/M (0-3)
   0 - LDGV.
   1 - LDGV and LDGT1.
   2 - LDGV and LDGT2.
   3 - LDGV and LDGT1 and LDGT2.
7. The identification rate for Technology IV vehicles (50-90). This rate is the assumed rate of identifying (correctly failing) Technology IV vehicles operating in a rich failure condition. Technology IV vehicles are typically 1981 and later Low altitude

non-California model year LDGVs or other vehicle types with equivalent technologies.

8. The new data flag which indicates whether or not alternative I/M credits are used in the MOBILE2 analysis. If this flag has a value greater than zero, new I/M credit data need to be supplied on Unit 4. The new I/M credit data are generated from an I/M applications simulation package. The possible values for the alternative I/M data flag are as follows:
   0 - No alternative I/M credits.
   1 - Alternative Technology I and II I/M credits.
   2 - Alternative Technology IV I/M credits.
   3 - Alternative I/M credits for all Technologies.

The format of the entire record including these three additional values is I2,1X,I2,1X,I1,1X,I2,1X,I2,1X,I1,1X,I2,1X,I1.

If IMFLG has the value of 1, MOBILE2 will assume that only LDGV's are affected by I/M, that the identification rate of Technology IV vehicles is 50, and that the new data flag is 0.

If users in a locality have an I/M program that cannot be simulated with the existing I/M software in MOBILE2, they should contact the I/M Staff of the U.S. EPA in Ann Arbor, Michigan, for alternate I/M credits. It is recommended that users not alter the MOBILE2 I/M credits without the guidance of the I/M staff. They support and maintain an I/M application simulation package that will produce alternative I/M credits specific to the user's locality. The simulation package produces the necessary information that is used directly by MOBILE2. Therefore, users should set the alternative I/M credit flag to zero until they have received alternative I/M credits from the I/M staff.

See Examples 2, 5, and 6 in Chapter 4.

2.2.5 Average Trips per Day and Average Miles per Day

If ICEVFG (Record No. 13) is set equal to 2 or 3, the user must enter records that contain the average trips per day and average miles traveled per day for each vehicle type. These are used to calculate total crankcase and evaporative HC emissions in grams per mile. This data should be entered on two records. The first record must contain the average number of trips per day for each of the eight vehicle types. The second record must contain the average miles traveled per day for each of the eight vehicle types. Both records have an "8F5.1" format and the data should be entered for the vehicle types in the following order: LDGV, LDGT1, LDGT2, HDGV, LDDV, LDDT, HDDV and MC. See Examples 3, 5, and 7 in Chapter 4.

2.3 PARAMETER SECTION

This section contains one or more groups of records describing the scenarios for which emission results are to be calculated. This section of input data follows the ONE-TIME DATA Section, if it exists; otherwise, it follows the CONTROL Section.

The user can calculate emissions for one or more scenarios. Each scenario is associated with one group of PARAMETER Section records.

The program terminates execution upon detecting an end-of-file condition.

Each group of PARAMETER Section records is composed of one to four records, the number being determined by the values of certain flag values in the CONTROL Section. The four possible records are as follows:

1. Scenario record (required).
2. VMT record (optional; required if VMFLAG = 1).
3. Additional LD correction factor record (optional; required if ALHFLG = 1 or 2).
4. Additional HDV Correction Factor Record (optional, but not recommended for use; required if TRKFLG = 1; see Section 2.3.4).

In the PARAMETER Section, the order of the optional records is the same order as the associated flags in the CONTROL Section.

The PARAMETER Section records are described below.

2.3.1 Scenario Record

Each scenario record contains the seven values describing the scenarios for which a set of emission factors is to be calculated.

The seven fields comprising each scenario record are described below in Table 2.3.1A.

Table 2.3.1A

DESCRIPTION OF FIELDS ON THE SCENARIO RECORD

Field	Var. Name	Description	Format	Allowed Values
1	IREJN	Specifies region for which emission factors are to be computed.	I1	1 = Low Altitude (49-State). 2 = California (Low altitude). 3 = High Altitude (49-State).
2	CY	Last 2 digits of calendar year for which emission factors are to be calculated.	I2	70 < = CY < = 99 or 00 < = CY < = 20
3	SPD	The single average route speed for which emissions are being calculated.[1]	F4.1	5. < = SPD < = 55. mph
	or SPD(8)	The separate average speeds for each of the eight vehicle types[2].	8(F4.1, 1X)	5. < = SPD < = 55. mph
4	TAMB	Ambient temperature, in degrees Fahrenheit.	F4.1	0°. < = TAMB < = 110.°
5	PCCN	Percent of VMT accumulated in cold start mode by non-catalyst equipped vehicle types.	F4.1	0. < = PCCN < = 100.
6	PCHC	Percent of VMT accumulated in hot start mode by catalyst equipped vehicle types.	F4.1	0. < = PCHC < = 100.
7	PCCC	Percent of VMT accumulated in cold start mode by catalyst equipped vehicle types.	F4.1	0.< = PCCC.< = 100.

---

[1] The one average speed input is required if SPDFLG = 0.

[2] The eight average speed inputs are required if SPDFLG = 2.

There is a one-column space between each of the above scenario fields. As a result, the FORTRAN format for each scenario record is either (I1, 1X, I2, 5(1X, F4.1)) or (I1, 1X, I2, 12(1X, F4.1)) depending upon the SPDFLG option.

The user should note that the percentage of VMT accumulated in the hot start mode by non-catalyst equipped vehicle types is not required for input. MOBILE2 calculates this quantity from the three similar values entered and equates it to the quantity PCHC + PCCC - PCCN. This constraint equation assumes that the percentage of hot stabilized VMT is equal for catalyst equipped and non-catalyst equipped vehicles. Other constraints are that both quantities PCHC + PCCC and PCHC + PCCC - PCCN must be in the zero through 100 percent range.

The user should not expect the sum of PCCN + PCHC + PCCC to equal 100%. While it is true that %cold start VMT + %hot start VMT + %hot stabilized VMT always equals 100% (and separately for catalyst equipped and non-catalyst equipped vehicles), the three items PCCN, PCHC, and PCCC are not equivalent to these variables.

Further, the user should be aware that the basic condition estimates for these variables are representative of the average number of daily trips per vehicle type. PCHC, PCCC, and PCCN are used in the calculation of the speed/temperature/operating-mode correction factor for the LDVs, LDTs, and MCs. It is assumed that LDDs and MCs are always non-catalyst equipped.

VALUES MUST BE ENTERED FOR ALL FIELDS IN THE SCENARIO RECORD. THERE ARE NO DEFAULT VALUES FOR THESE VARIABLES.

2.3.2 VMT Mix Record

If VMFLAG (Record No. 5) has the value 1, a VMT record is required following each scenario record. It contains the VMT mix that the user wishes to use for this scenario only. The record has the format 8F4.3, the eight values are the fraction of the total VMT for each of the eight vehicle types. The eight fractions should sum to 1. If the same VMT mix is to be used for each scenario, VMFLAG should be set to 2 and the VMT mix entered in the ONE-TIME DATA Section. See Section 2.2.1 above. Also see Example 4 in Chapter 4.

2.3.3 Additional LDG Correction Factors Record

If ALHFLG (Record No. 9) equals 1 or 2; this record is required. One of the following records is required for each scenario record.

ALHFLG = 1. The format of the additional LDV correction factor record is 6F4.3. The six values to be supplied are as follows:

One air conditioning factor used to indicate whether or not air conditioning effects are to be accounted for in the resulting emission factors. If the factor entered is zero, then no air conditioning correction factors are applied. If the factor entered is greater than zero (but must be less than or equal to 1.0), air conditioning correction factors are applied. In MOBILE1 this factor is the percentage of A/C equipped vehicles with A/C in use. However, MOBILE2 uses the input factor as a yes or no condition switch and calculates the percentage in use. The selection of an air conditioning correction factor is handled this way to provide compatibility with MOBILE1 input data.

Three extra load fractions (LDGV, LDGT1, and LDGT2). These values are the fractions of each vehicle type with an extra 500 pound load. These fractions must be in the range of zero through one.

One trailer towing fraction. This value is the fraction of light duty vehicles and trucks towing a trailer. This fraction must be in the range of zero through one.

One humidity value. This value is the absolute (specific) humidity in grains of water per pound of dry air that is to be modeled and must be in the range of 20 through 140.

ALHFLG = 2. The format of the record is (8F4.3,2F4.1). When ALHFLG = 2, the inputs for the additional LD correction factor parameters are the same as for ALHFLG = 1, except that there are separate trailer towing fractions for LDGV, LDGT1, and LDGT2. Also, dry and wet bulb temperatures are required. MOBILE2 calculates the A/C usage fraction based on the ambient dry and wet bulb temperatures that are input.

If the extra load or trailer towing parameters are set to zero, then their respective correction factors will calculate to 1. If humidity is set to 75, the humidity NOx correction factor will calculate to 1. See Examples 4, 5, and 8 in Chapter 4.

2.3.4 Additional HDV Correction Factor Record

MOBILE2 does not calculate an additional HDV correction factor as does MOBILE1. However, if TRKFLG (record No. 10) equals 1, a record is required in the PARAMETER Section to preserve input sequence compatibility with MOBILE1. Any data (or blank line) may be entered. One of these records is required for each scenario record. This record will not be used in MOBILE2 calculations, thus users should set TRKFLG to 0 to avoid this data requirement. See Example 1 in Chapter 4.

2.4 SUMMARY OF MOBILE2 INPUT SEQUENCE

Table 2.4.1A lists the input records for a MOBILE2 run, in the order required by the program.

Records in parentheses are optional, and are required only if certain flags are set. Records without parentheses are required.

Table 2.4.1A

MOBILE2 INPUT RECORD SEQUENCE SUMMARY

INPUT RECORD SEQUENCE	SECTION
1 IPROMT FLAG record	CONTROL
1 PROJID record	CONTROL
1 INFLAG FLAG[1] record	CONTROL
1 SPDFLG FLAG[1] record	CONTROL
1 VMFLAG FLAG[1] record	CONTROL
1 MYMRFG FLAG[1] record	CONTROL
1 ALTFLG FLAG[1] record	CONTROL
1 IMFLG FLAG[1] record	CONTROL
1 ALHFLG FLAG[1] record	CONTROL
1 TRKFLG FLAG[1] record	CONTROL
1 IFORM FLAG[1] record	CONTROL
1 PRTFLG FLAG[1] record	CONTROL
3 ICEVFG FLAG[1] record	CONTROL
1 IDLFLG FLAG[1] record	CONTROL
1 NHMFLG FLAG[1] record	CONTROL
1 UNFFLG FLAG[1] record	CONTROL
(1 VMT MIX record, required if VMFLAG = 2)	ONE-TIME DATA
(16 MILEAGE ACCRUAL records, required if MYMRFG = 1 or 3)	ONE-TIME DATA
(16 REGISTRATION DISTRIBUTION records, required if MYMRFG = 2 or 3)	ONE-TIME DATA
(2-100 EMISSION FACTOR MODIFICATION records, required if ALTFLG = 1)	ONE-TIME DATA
(1 I/M PARAMETER record, required if IMFLG = 1 or 2)	ONE-TIME DATA
(1 TRIPS/DAY record, required if ICEVFG = 2 or 3)	ONE-TIME DATA
(1 MILES/DAY record, required if ICEVFG = 2 or 3)	ONE-TIME DATA
1 SCENARIO record	PARAMETER[2]
(1 VMT MIX record, required if VMFLAG = 1)	PARAMETER
(1 LD ADDITIONAL CORR. FACTOR record, required if ALHFLG = 1 or 2)	PARAMETER
(1 HD ADDITIONAL CORR. FACTOR record, required if TRKFLG = 1)	PARAMETER

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[1] These 14 flags are inputted on a single record if IPROMT = 2 or 3.

[2] The sequence of records in the PARAMETER Section is repeated in order for as many scenarios as the user requires.

Chapter 3

MOBILE2 OUTPUT

3.0 INTRODUCTION

MOBILE2 has three types of output: formatted reports, diagnostic messages and prompting messages. Each of these output types are discussed within this chapter.

Five types of formatted reports can be selected in MOBILE2. These reports include the information necessary to identify the scenario being studied and the calculated emission factors by vehicle type. The type of formatted report that is output by MOBILE2 is controlled by the IFORM flag in the CONTROL Section.

The diagnostic messages are used in MOBILE2 to identify dubious data. Three types of diagnostics exist: errors, warnings, and comments. In all cases, an error will terminate the program. Warnings and comments are included for users to analyze the results given by MOBILE2.

Prompting messages are available from MOBILE2 depending upon the value entered by the user for the IPROMT flag. These messages prompt the user to insert the MOBILE2 input data in the proper sequence. There are two basic types of prompting messages: for vertical data input and hortizontal data input. Except for the data supplied in the CONTROL Section, both types of prompting messages are identical.

3.1 FORMATTED REPORT OUTPUT

There are five different types of formatted output. The user specifies which of the five is to be generated by choosing the IFORM value (Record No. 11). If IFORM = 0 or 2, MOBILE2 generates a formatted data set suitable for use as input to subsequent computer analysis ("numeric" output). If IFORM = 1, 3, or 4, a more descriptive report is generated. These latter three "descriptive" outputs are designed to provide a well annotated record of the user's analysis.

If IFORM = 0 or 1, MOBILE2 prints reports that are almost identical to the MOBILE1 program. However, MOBILE2 reported emission values will differ from MOBILE1's due to changes in calculations and emission factors. When IFORM = 0 or 1, printed reports do not contain all the information. Specifically, neither LDDV nor LDDT information is displayed when IFORM = 0 or 1.

Expanded reports may be obtained by setting IFORM = 2, 3, or 4. The expanded reports include a listing of LDDV and LDDT emission results as well as a combined LDGT category results. Although individual light duty diesel results are not printed for IFORM = 0 or 1, the "total" emissions do include diesel emissions.

3.1.1 Original (MOBILE1) Numeric Format (IFORM=0)

When IFORM=0, the original (MOBILE1) "numeric" format is generated. The output consists of four heading records (to give minimal column descriptions), followed by one record for each pollutant (selected by PRTFLG) for each scenario. When ICEVFG = 1 or 3 (print crankcase and evaporative HC emissions) and PRTFLG = 0 or 1 (print HC), the evaporative HC emission factor is printed with 'E' as the pollutant identifier (in addition to the HC emission factors).

For example, if the user wishes to calculate emission results for 10 scenarios and wishes to output emission factors for all three pollutants, there will be a total of 30 data records in the output data set for the scenarios plus the four heading records. However, if the value of PRTFLG (Record No. 12) is 2 (print CO only), for example, 14 records will be printed for the 10 scenarios (the 10 scenarios plus four heading records).

Each numeric output record has 23 columns. These columns are described below:

The record contains fields that correspond to (reading from left to right) the region, the calendar year, three speeds (LDGV, HDGV and MC, which will be identical if SPDFLG=0), the ambient temperature, the three VMT cold/hot start percentages (PCCN, PCHC, and PCCC), pollutant code ('1' for HC, '2' for CO, '3' for NOx, and 'E' for the crankcase and evaporative HC emissions), the six composite emission factors (for the six vehicle types; excluding the LDDV and LDDT emissions), six VMT fractions, and the average emission factor for all vehicles combined (including LDDVs and LDDTs). This record lists the data on the input SCENARIO record, followed by six vehicle type emission factors, the VMT mix, and the average combined emission factor for all eight vehicle types. See Example 1 in Chapter 4.

3.1.2 Original (MOBILE1) Descriptive Format (IFORM=1)

The original "descriptive" format output data set is created if IFORM=1. This data set is organized for easy visual analysis. The information generated in this data set is described below:

The first line printed is the title provided by the user in the second input record.

If ALTFLG=1, the output then contains a listing of the emission rate modification information. This is described in detail later within this subsection.

This is followed by a reminder that the HC emission factors include crankcase and evaporative HC emission factors. The rest of the emission report output consists of one or more sections, identical in format, which are separated by dashed lines. Each section corresponds to one calendar year of the emission output.

Each of these sections consists of two parts: the top part describes the scenario for which emission factors are calculated; the bottom part presents the calculated emission factors.

The first line of the output describing the scenario lists the calendar year, temperature, and VMT mix being modeled. If the user did not include a VMT mix in the input data set, the calculated MOBILE2 VMT mix is listed. The second line begins with the identification of the region (49-State Low altitude, California, or 49-State High altitude). This is followed by speed information. The speeds for LDGV, HDGV and MC are separated by slashes. The speed for the HDGV speed correction calculation is given again in parentheses. In the case of SPDFLG=0, all of these speed values are identical. The speed information is followed by the operating mode VMT percentages from the SCENARIO record.

If the user has set either ALHFLG or IMFLG to be greater than 0, additional lines follow describing input parameters associated with these options.

The bottom part of each output section displays the computed emission factors. The emission factors for the six vehicle types are listed in the first six columns. Light duty diesel vehicles (LDDV) and light duty diesel trucks (LDDT) are not printed. The next column contains the average combined emission factor for all vehicles, which has been calculated from the vehicle-specific emission factors and the VMT mix, and includes LDDVs and LDDTs.

As mentioned above, if ALTFLG=1, the output begins (following the title) with a listing of the emission rate modification information. The modification information listed in this printed description is the same data that the user included in the input data set. The columns labeled "BASE" and "DR" refer to the new zero mile emission level and emission deterioration rate; respectively. There is an additional column labeled "ALTERED", which will have one of two entries: "YES" or "NO". If a listed emission factor modification has the value "YES" in this column, the modification was made and the new factor has been used in the MOBILE2 run. If a listed modification has the value "NO", the modification was not made due to constraints on the size of internal program arrays.

See Examples 2 and 8 in Chapter 4.

3.1.3 Expanded Numeric Format (IFORM=2)

An expanded "numeric" format report is generated if IFORM = 2. The data set consists of a title and twelve heading records (to give minimal column descriptions), followed by a group of records for each pollutant (selected by PRTFLG) for each scenario. Each group of records consists of 3 lines of output. If PRTFLG = 0 or 1 and ICEVFG = 1 or 3, the crankcase and evaporative HC emissions are displayed with "E" as the pollutant number.

For example, if the user calculates emissions for 10 scenarios and prints emissions factors for all three pollutants (PRTFLG=0 and ICEVFG = 0 or 2), 90 data records (excluding heading records) will be generated. On the other hand; if PRTFLG equals 2, thirty data records (excluding heading records) will be generated for 10 scenarios.

The information printed on each record is described below.

Each record within the three record group is labeled either "A", "B", or "C". The records contain the following fields, from left to right:

The "A" record contains the region, calendar year, eight vehicle speeds (identical if SPDFLG = 0), ambient temperature, three cold/hot start VMT percentages, and altitude;

The "B" record contains the pollutant code (1=HC, 2=CO, 3=NOx, and 'E' for the crankcase and evaporative HC emissions), nine calculated emission factors (for the eight ordinary vehicle types plus the combined LDGT);

The "C" record contains the VMT mix, and the average emission factor for all vehicles combined.

Thus, this record group lists the input data entered on the input SCENARIO record, followed by the emission factors for nine vehicle types, the VMT mix, and the average emissions for all vehicles combined. See Example 3 in Chapter 4.

3.1.4 Expanded 112-Column Descriptive Format (IFORM=3)

A "descriptive" format output data set is created if IFORM = 3. This data set is organized for easy visual analysis. The information generated in this data set is much the same as that given when IFORM = 1, with two basic exceptions: 1) the arrangement of the output is different and 2) the combined LDGT category as well as the LDDV and LDDT emissions are listed.

The first line printed is the identifying title assigned by the user in the second input record.

If ALTFLG=1, the output then contains a listing of the emission rate modification information. This is described later within this subsection.

This emission rate modification information is followed by a note reminding the user that HC emission factors include crankcase and evaporative HC emissions. The rest of the output consists of one or more sections of emission results with appropriate headings. Each section corresponds to a given calendar year; successive sections are separated by dashed lines.

Each of these sections consists of two parts: the top part describes the scenario for which emission factors are calculated; the bottom part presents the calculated emission results.

The first line of the descriptive portion of the output lists the calendar year, region, altitude, ambient temperature, and the cold/hot start VMT percentages used in the scenario. As an option (ALHFLG=2), the next line can list the A.C. usage fraction, the dry/wet bulb temperatures, and the absolute humidity. A further option may be selected such that the next five to fourteen lines contain the I/M program information. These optional lines depend on the flag IMFLG.

If an I/M program has been specified (IMFLG = 1 or 2), five lines are produced which display (line 1) the starting year of the I/M program and the vehicle types affected, (line 2) the stringency level and mechanic training indicator, (line 3) the model years affected by the I/M program, and (lines 4&5) the Technology IV identification rate.

If the user has supplied new I/M credits (IMFLG=2 and NUDATA= 1, 2, or 3), then zero to nine text lines input by the user on unit 4 will be displayed.

The columns in the succeeding lines are organized by vehicle type. In some instances, column entries will be blank indicating that the parameters are not applicable to certain vehicle types. Each additional line lists the values of one parameter. The lines are arranged in the following sequence: vehicle speeds, VMT mix, extra load usage fractions, trailer towing usage fractions, basic exhaust emission factors, and idle emission factors. The extra load and trailer towing lines are both optional. They are listed only when ALHFLG= 1 or 2. The emissions listed are those selected by the flags: PRTFLG, ICEVFG, IDLFLG, and NMHFLG.

As mentioned above, if ALTFLG = 1, the output begins (after the title) with a listing of the emission rate modification information. The printed description consists of the same data the user included in the input data set. The columns labeled "BASE" and "DR" refer to the new zero mile emission level and emission deterioration rate; respectively. See examples 4, 6, and 7 in Chapter 4.

3.1.5 Expanded 80-column Descriptive Format (IFORM=4)

An 80-column "descriptive" format output data set is produced if IFORM=4. This data set is organized for easy visual analysis on a terminal which only permits 80-column output. The information generated in this data set is identical to the output generated when IFORM=3; except the width and placement of ambient temperature and cold/hot-start percentages are changed. These values are printed on the line following the "CAL YEAR" line. See Example 5 in Chapter 4.

3.2 DIAGNOSTIC MESSAGES

This section describes the MOBILE2 diagnostic messages. Running MOBILE2 can result in three types of diagnostic messages: (1) error messages, (2) warning messages, or (3) comments. Appendix A will describe the program variables given in the diagnostics messages.

Error messages indicate either invalid input data were entered into MOBILE2, or MOBILE2 attempted to perform invalid operations. All error messages are prefixed by "***ERROR:". If a number follows "***ERROR:", it is the value read by MOBILE2 for the variable in error (the variable name is also printed). If the error message is due to an input value that is an out of bounds, the range of acceptable values is also printed. An error will stop a MOBILE2 run.

Warning messages indicate that MOBILE2 input data caused an operation not necessarily intended by the user. However, the situation is not serious enough to be labeled an error. Nonetheless, users should examine the warning messages to ascertain the conditions that were modeled.

Comments are a type of warning message that are printed for the user's information. Neither a warning nor a comment will stop a MOBILE2 run.

The following is a list of the individual error, warning, and comment messages. Since most messages refer to user-input values, the messages are mostly grouped by input record type.

3.2.1 FLAG (CONTROL Section) Record Diagnostics

E1. "ERROR: 'value of IPROMT' OUT OF BOUNDS FOR FLAG IPROMT
PROMPT/MODE TYPE (0 to 3) MUST BE CORRECTED BEFORE YOUR NEXT RUN."
This message appears if IPROMT does not equal 0, 1, 2, or 3. This correction must be made before the program will proceed.

E2. "YOU MUST CORRECT ALL FLAGS BEFORE YOU RUN AGAIN."
This message appears if there is an error in reading the CONTROL flags. It should appear after a list indicating which flags are in error (see E3). The flags in error must be corrected before the program will continue.

E3. "ERROR: 'value of flag' OUT OF BOUNDS FOR FLAG 'name of flag'"

This error message precedes the E2 message and program termination.

This message will appear for each flag which is in error. The number appearing after "ERROR:" is the value of the flag read by the program. The allowable flag values are listed in the CONTROL Section (2.1). Each of these messages indicate the value falls outside of the valid bounds for that flag.

W1. "WARNING: FLAG TRKFLG IGNORED. "TRKOPC" NO LONGER USED."
TRKFLG is a flag used in MOBILE1 to indicate whether to consider a power/CID correction factor for heavy duty vehicles. This correction factor is not used in MOBILE2. Setting TRKFLG = 0 will eliminate this warning. See Section 2.1.1.

W2. "WARNING: FLAG UNFFLG IGNORED. NO FILE WILL BE WRITTEN"
This message is printed if UNFFLG does not equal 0. UNFFLG is the flag used in MOBILE1 to print an unformatted output. This option is not available in MOBILE2. Setting UNFFLG = 0 will eliminate this warning. See Section 2.1.2.

```
C1.  "COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE
                     IOUUNF = 'unformatted unit'
                     IOUREP = 'formatted report unit'
                     IOUERR = 'error/warning/comment unit'
                     IOUASK = 'prompt message unit'
```

This message appears whenever any of the default output units numbers are changed.

3.2.2 VMT Mix Record Diagnostics

E4. "ERROR: 'value of VMTMIX(I)' OUT OF BOUNDS FOR VMTMIX (0. TO 1.)" This message is printed if a value of VMTMIX(I) (vehicle-miles-traveled fraction for vehicle type I) is not between 0. and 1. See Section 2.2.1.

E5. "ERROR: 'Value of VMTMIX SUM' SUM OF VMTMIX IS NOT EQUAL TO 1. This message is printed if the sum of VMTMIX(I) over all vehicle types is not equal to 1. Since each VMTMIX(I) represents the fraction of total miles that vehicle type I contributes to the total vehicle-miles-traveled by the fleet, the sum of these fractions should equal 1. See Section 2.2.1.

E6. "ERROR: THERE ARE NO SALES FOR VEHICLE 'vehicle name' " It is assumed that no significant number of LDDVs exist before 1975. Similarly, no LDDTs are assumed prior to 1978. This message is printed if the user inputs a positive VMT fraction for LDDVs or LDDTs for calendar years in which they are assumed to be virtually nonexistent.

E7. "ERROR: EFRETM < =0. AND VMTMIX > 0. FOR VEHICLE 'vehicle name'" No emissions exist for the named vehicle type which is a non-zero member of the total vehicle fleet mileage.

E8. "ERROR: IDLRTM < =0. AND VMTMIX > 0. FOR VEHICLE 'vehicle name'" No idle emissions exist for the named vehicle type which is a non-zero member of the total vehicle fleet mileage.

3.2.3 Mileage Accrual and Registration Distribution Diagnostics

E9. "ERROR: 'value of SAVMYM(I,J)' NEGATIVE MODEL YEAR MILEAGE" This message is printed if the user supplied mileage accural data for model year I and vehicle type J is negative. See Section 2.2.2.

E10. "ERROR: 'value of SAVMYR(I,J)' NEGATIVE MODEL YEAR REGISTRATION" This message is printed if the model year registration fraction is negative. Since this number represents the fraction of all vehicles in the fleet of a given age, it should be between 0 and 1; inclusive. See Section 2.2.2.

E11. " ERROR: MYR OF LDDV NOT EQUAL TO LDGV FOR IDX = 'value of IDX'" For description see E12.

E12. "ERROR: MYR OF LDDT NOT EQUAL TO LDGT1 FOR IDX = 'value of IDX'" Messages E11 and E12 will appear if the user entered a different registration distribution for LDGVs and LDDVs or for LDGT1 and LDDTs. The registration mix for the total LDV (or LDT) fleet is to be input twice for the gasoline powered and diesel powered vehicles (or trucks). MOBILE2 has an internal function that apportions total registrations into the separate gasoline and diesel powered groups. Thus, it is assumed in MOBILE2 that LDDs will replace some of their LDG counterparts and will be used in the same way. See Section 2.2.2.

W3. "WARNING: 'value of SAVMYR' REGISTRATION WITH ZERO MILEAGE" See description in W4.

W4. "WARNING: 'value of SAVMYM' MILEAGE WITH ZERO REGISTRATION"
One of the two preceding messages is printed if, for a given vehicle age, vehicles either do not accumulate mileage, yet make up a fraction of the fleet, or do not make up a fraction of the fleet but accumulate mileage. If a mileage accrual value or a registration fraction is zero, both should be zero. See Section 2.2.2.

W5. "WARNING: 'value of MYRSUM' MYR SUM NOT = 1. (WILL NORMALIZE)"
This message is printed if the sum of model year registration fractions for a given vehicle type do not sum to 1. If the model year age registration fractions do not sum to 1, MOBILE2 will normalize the fractions so that they will. See Section 2.2.2.

3.2.4 Emission Factor Modification Diagnostics

E12. "ERROR: 'value of NEWFAC' OUT OF BOUNDS FOR (1 to 100 PAIRS)"
This message is printed if the number of emission rate modifications is not between 1 and 100. MOBILE2 is limited to handle a maximum of 99 modifications. See Section 2.2.3.

E13. "ERROR: 'value of IRGALT' OUT OF BOUNDS FOR ALTEQU REGION (1,2,3 ONLY)"
The region entered for an alternate emission equation can be specified as 1, 2 or 3 only. It is independent of the region entered in the SCENARIO record. See Section 2.2.3.

E14. "ERROR: 'vehicle type code' OUT OF BOUNDS FOR VEHICLE TYPE (1 TO 8)"
This message is printed if the vehicle type in the emission rate modification section is not equal to 1, 2, 3, 4, 5, 6, 7, or 8. MOBILE2 has eight vehicle types. These types and their corresponding codes are: (1) light duty gasoline powered vehicles, (2) light duty gasoline powered trucks I (0 - 6,000 lbs. GVW), (3) light duty gasoline powered trucks II (6,001 - 8,500 lbs. GVW), (4) heavy duty gasoline powered vehicles, (5) light duty diesel powered vehicles, (6) light duty diesel powered trucks, (7) heavy duty diesel powered trucks, and (8) motorcycles. See Section 2.2.3.

E15. "ERROR:'pollutant code' OUT OF BOUNDS FOR POLLUTANT (1 TO 3)"
This message is printed if the code for pollutant on the emission rate modification input section is not equal to 1, 2, or 3. MOBILE2 considers only 1 for hydrocarbons, 2 for carbon monoxide, and 3 for oxides of nitrogen. See Section 2.2.3.

E16. "ERROR: 'value of MYFRST or MYLAST' OUT OF BOUNDS FOR YEAR (1951 TO 2020)"
This message is printed if the code, corresponding to the first or last model year to have altered emission rates is not between 51 and 99 or 00 and 20 (corresponding to years 1951-2020). See Section 2.2.3.

E17. "ERROR: LAST YEAR CANNOT BE LESS THAN FIRST YEAR"
This message is printed if the first model year to have its emission rates altered is less than the last model year to be altered. See Section 2.2.3.

E18. "ERROR: 'value of BASNEW' INTERCEPT MUST BE POSITIVE"
This message is printed if a new zero mile emission level is negative or zero. See Section 2.2.3.

E19. "ERROR: EQUATION 'number of equation' CAUSES MORE THAN 15 ALLOWED FOR ANY 1 REG/MODE/POL."
When emission rate modifications are made, no more than 15 modified emission equations may be input for any region, vehicle type, and pollutant combination. See Section 2.2.3.

E20. "ERROR: EFRETM > 0. AND GSF=0. FOR VEHICLE 'vehicle name'"
This error message will be printed if the named vehicle type has a positive emission factor and a zero fleet sales fraction.

E21. "ERROR: IDLRTM > 0. AND GSF=0. FOR VEHICLE 'vehicle name'"
The named vehicle type has a positive idle emission and a zero fleet sales fraction.

W6. "WARNING: 'value of DELNEW' NEGATIVE SLOPE FOR AGEING VEHICLE"
This message is printed if the value for the exhaust deterioration rate is negative. A negative deterioration rate implies improving emissions with increasing mileage accumulation. See Section 2.2.3.

W7. "WARNING: EQUATION 'equation number' ZEROES ALL IDLE COEFFICIENTS (and TOTAL) FOR IR = 'region', IV = 'vehicle', IP = 'pollutant'".
All alternative emission equations cause the program to zero all idle emission equations corresponding to the region, vehicle type, and pollutant modified.

3.2.5 Inspection/Maintenance Data Diagnostics

E22. "ERROR: 'value of ICYIM' OUT OF BOUNDS FOR YEAR (1970 TO 2020)"
This message is printed if the code indicating the year in which an I/M program is to begin does not fall between 70 and 99, or 00 and 20 (years 1970 to 2020). See Section 2.2.4.

E23. "ERROR: 'value of ISTRIN' OUT OF BOUNDS FOR STRINGENCY (10 TO 50)"
This message is printed if the stringency of the I/M program is not between 10 and 50; inclusive. See Section 2.2.4.

E24. "ERROR: 'value of IMTFLG' OUT OF BOUNDS FOR MECHANICS TRAINING (0 TO 1)"
This message is printed if the value for the mechanics training flag, IMTFLG, is not equal to 0 or 1. See Section 2.2.4.

E25. "ERROR: 'value of MODYR1' OUT OF BOUNDS FOR MODYR1 (1951 TO 2020)"
This message is printed if the code representing the first model under an I/M program is not between 51 and 99, or 00 and 20 (years 1951 and 2020). These years are the limits set by MOBILE2. See Section 2.2.4.

E26. "ERROR: 'value of MODYR2' OUT OF BOUNDS FOR MODYR2 (1951 TO 2020)"
This message is printed if the code representing the last model year under an I/M program is not between 51 and 99, or 00 and 20 (years 1951 to 2020). See Section 2.2.4.

E27. "ERROR: MODYR1 CANNOT BE GREATER THAN MODYR2"
This message is printed if the first model year in an I/M program is greater than the last model year in an I/M program. See Section 2.2.4.

E28. "ERROR: 'Value of ILDT' OUT OF BOUNDS FOR VEHICLE TYPE (0 TO 3)"
Value for the vehicle types to which I/M is applied is not between 0 and 3. See Section 2.2.4.

E29. "ERROR: 'Value of IOPTN' OUT OF BOUNDS FOR OPTION (50 TO 90)"
Value of the I/M identification rate for Technology IV vehicles is not between 50 and 90. See Section 2.2.4.

E30. "ERROR: 'Value of NUDATA' OUT OF BOUNDS FOR NEW DATA FLAG (0 TO 3)"
Value of the NUDATA flag (the flag from the I/M parameter record that indicates whether or not new I/M credits will be read from unit IOUIMD) is not 0, 1, 2, or 3. See Section 2.2.4.

E31. "ERROR WHILE READING UNIT IOUIMD (NEW) I/M CREDITS. RUN ABORTED."
This message appears if any error occurs while reading the new I/M credit data from unit IOUIMD (Unit 4). If this message is printed, check subroutine NEWDAT and Section 2.2.4 to confirm that data are being read correctly.

3.2.6 Trips/Day and Miles/Day Record Diagnostics

E32. "ERROR: 'value for USRTPD' AVERAGE TRIPS/DAY CANNOT BE NEGATIVE"
This message is printed if the user supplied trips per day is negative. See Section 2.2.5.

E33. "ERROR: 'value of USRMPD' AVERAGE MILES/DAY CANNOT BE NEGATIVE"
This message is printed if the user supplied miles per day is not positive. See Section 2.2.5.

3.2.7 Scenario Record Diagnostics

Individually, errors described below will not cause the program to stop but will void analysis of the scenario associated with the error and all subsequent scenarios. If one of these messages appears, the error must be corrected for that scenario. If more than 50 of these errors occur the program run will stop.

E34. "ERROR: 'region code' OUT OF BOUNDS FOR REGION (1, 2, 3, 5 ONLY)"
This message is printed if the region chosen in the scenario record is not equal to 1, 2, or 3. See Section 2.3.1. Note: Do not use region 5. It is intended to be used for evaluated altitude, but MOBILE2 software does not currently support this option.

E35. "ERROR 'value of CY' OUT OF BOUNDS FOR YEAR (1970 TO 2020)"
This message is printed if the calendar year to be evaluated is not between 1970 and 2020, inclusive. (This is a limitation of MOBILE2.) See Section 2.3.1.

E36. "ERROR: 'value of SPD(I)' SPEED MUST BE POSITIVE"
This message is printed if the value for average speed is not positive. See Section 2.3.1.

E37. "ERROR: 'value of TAMB' VALID TEMPERATURE IS 0-110 DEG (F)"
This message is printed if the temperature value does not fall between 0 and 110°F. These limits correspond to the limits of the temperature correction factor. See Section 2.3.1.

E38. "ERROR: 'value of PCCN' OUT OF BOUNDS FOR PCCN (0. TO 100.)"
This message is printed if the input value for percentage of miles traveled in the cold start mode for non-catalyst vehicles is not in the 0-100% range. See Section 2.3.1.

E39. "ERROR: 'value of PCHC' OUT OF BOUNDS FOR PCHC (0. TO 100.)"
This message is printed if the input value for percentage of miles traveled in the hot-start mode for catalyst vehicles is not in the 0-100% range. See Section 2.3.1.

E40. "ERROR: 'value of PCCC' OUT OF BOUNDS FOR PCCC (0. TO 100.)"
This message is printed if the input value for percentage of miles traveled in the cold-start mode for catalyst vehicles is not in the 0-100% range. See Section 2.3.1.

E41. "ERROR: 'value of sum PCHC + PCCC' OUT OF BOUNDS (0. < = PCHC + PCCC < = 100.)"
The sum of the cold/hot start VMT percentages for vehicles with catalytic converters must lie in the range of 0 to 100 percent. See Section 2.3.1.

E42. "ERROR: 'value of sum PCHC + PCCC - PCCN' OUT OF BOUNDS (0.< =PCHC + PCCC - PCCN < = 100.)"
The sum of the cold/hot start VMT percentages for vehicles with catalytic converters less that of the non-catalytic converter equipped vehicles must lie in the range of 0 to 100 percent. See Section 2.3.1.

E43. "ERROR: 'value of ALT' OUT OF BOUNDS FOR ALTITUDE (-200 TO 10,000 ft.)"
The altitude entered must lie between 200 feet below and 10,000 feet above mean sea level. See Section 2.3.2. Note: This message would only occur if the user inputs region 5. Region 5 for intermediate altitude is currently not supported by MOBILE2.

W8. "WARNING: 'value of SPD' SPEED REDUCED TO 55 M.P.H. MAXIMUM"
This message appears if the value for speed is greater than 55. MOBILE2 limits the speed to 55 mph, and sets values greater than 55 to 55 mph. Speed correction factor equation coefficients are only valid in the range of 5 mph through 55 mph See Section 2.3.1.

W9. "WARNING: 'value of SPD' SPEED INCREASED TO 5 M.P.H. MINIMUM"
This message is printed if the average speed is less than 5 mph. An average speed of less than 5 mph is assumed to be unlikely, and the value is be set to 5 mph. Speed correction factor equation coefficients are only valid for speeds of 5 mph through 55 mph. See Section 2.3.1.

3.2.8 Additional LD Correction Factor Record Diagnostics

E44. "ERROR: 'value of AC' OUT OF BOUNDS FOR AC (0. TO 1.)"
The air conditioning input value that indicates whether the A/C correction factor is used must range from zero to one. See Section 2.3.3.

E45. "ERROR: 'value of XLOAD(I)' OUT OF BOUNDS FOR EXTRA LOAD (0. TO 1.)"
Extra load usage fraction for each vehicle type must range from zero to one. See Section 2.3.3.

E46. "ERROR: 'value of TRAILR(I)' OUT OF BOUNDS FOR TRAILERS (0. TO 1.)"
Trailer towing usage fraction for each vehicle type must range from zero to one. See Section 2.3.3.

E47. "ERROR: 'value of ABSHUM' OUT OF BOUNDS FOR HUMIDITY (20. TO 140.)"
Absolute humidity (grains/pounds) must range from 20 to 140. See Section 2.3.3.

E48. "ERROR: WB TEMP CANNOT BE GREATER THAN DB TEMP"
Wet bulb temperature must be less than or equal to the dry bulb temperature. See Section 2.3.3.

C2. "COMMENT: A/C CORRECTION FACTOR WILL BE CALCULATED .
VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED."
This message appears if a value for air conditioning usage other than zero is entered. The air conditioning usage is a function of the temperature. Therefore, the A/C usage calculated in MOBILE2 may vary from the value read.

3.2.9 Miscellaneous Data-Related Diagnostics

E49. "EXCESS DATA ERRORS PREVENT FURTHER ANALYSIS"
This message should be the last of a list of 50 or more messages. The other messages should be analyzed to determine the problems causing the errors and corrected.

3.2.10 Internal Software Error Diagnostics

E50. "ERROR: 'error code value' UNKNOWN"
This message should only be printed when there is an unspecified or unrecognized internal software error.

E51. "ERROR: 'default value of named function' DEFAULT USED FOR 'year' IN FUNCTION 'function name'"
This message indicates a default exit has been taken which implies that one or more of the internally associated year/data pairs is in error. The program must be corrected and re-compiled before another run. See Appendix A.

E52. "ERROR: DEFAULT USED FOR 'year' IN INDEX FUNCTION 'index function name'"
This message indicates a default exit has been taken which implies that one or more of the associated year/years's position pairs is in error. The program must be corrected and re-compiled before another run. See Appendix A.

3.3 PROMPTING MESSAGES

If IPROMT=1 or IPROMT=3, the user is prompted for input data in the order needed by MOBILE2. Prompting messages are written to unit 6 by default, unless the user redefines the prompting message unit (see Section 2.1.1). The first record (IPROMT and IOUNEW assignment record) is not prompted.

The prompt for each record type is described below. Refer to Chapter 2 for a detailed discussion of the prompted values.

3.3.1 Title Record Prompt

The title record is prompted for by:

"ENTER PROJECT I.D.:"

3.3.2 14 Remaining Flag Prompts

If IPROMT=1 (vertical format), the 14 remaining CONTROL SECTION flags are prompted for individually, with the prompts:

```
"ENTER   INFLAG:"
"ENTER   SPDFLG:"
"ENTER   VMFLAG:"
"ENTER   MYMRFG:"
"ENTER   ALTFLG:"
"ENTER   IMFLG:"
"ENTER   ALHFLG:"
"ENTER   TRKFLG:"
"ENTER   IFORM:"
"ENTER   PRTFLG:"
"ENTER   ICEVFG:"
"ENTER   IDLFLG:"
"ENTER   NMHFLG:"
"ENTER   UNFFLG:"
```

If IPROMT=3 (horizontal format), the 14 remaining CONTROL SECTION flags are prompted for on one record with the single prompt:

```
"ENTER INFLAG, SPDFLG, VMFLAG, MYMRFG, ALTFLG, IMFLG, ALHFLG,
TRKFLG, IFORM, PRTFLG, ICEVFG, IDLFLG, NMHFLG, & UNFFLG"
```

3.3.3 VMT Mix Record Prompt

The eight VMT values are prompted for by

"ENTER VMT SPLIT:"

3.3.4 Mileage Accrual Prompts

If MYMRFG=1 or 3, 16 mileage accrual records are individually prompted for by:

```
"ENTER MYM AGES   1-10   FOR   LDGV:"
"ENTER MYM AGES  11-20   FOR   LDGV:"
"ENTER MYM AGES   1-10   FOR   LDGT1:"
"ENTER MYM AGES  11-20   FOR   LDGT1:"
"ENTER MYM AGES   1-10   FOR   LDGT2:"
"ENTER MYM AGES  11-20   FOR   LDGT2:"
"ENTER MYM AGES   1-10   FOR   HDGV:"
"ENTER MYM AGES  11-20   FOR   HDGV:"
"ENTER MYM AGES   1-10   FOR   LDDV:"
"ENTER MYM AGES  11-20   FOR   LDDV:"
"ENTER MYM AGES   1-10   FOR   LDDT:"
"ENTER MYM AGES  11-20   FOR   LDDT:"
"ENTER MYM AGES   1-10   FOR   HDDV:"
"ENTER MYM AGES  11-20   FOR   HDDV:"
"ENTER MYM AGES   1-10   FOR   MC:"
"ENTER MYM AGES  11-20   FOR   MC:"
```

3.3.5 Model Year Registration Data Prompts

If MYMRFG = 2 or 3, 16 model year registration records are individually prompted for by:

```
"ENTER MYR AGES   1-10   FOR   LDGV:"
"ENTER MYR AGES  11-20   FOR   LDGV:"
"ENTER MYR AGES   1-10   FOR   LDGT1:"
"ENTER MYR AGES  11-20   FOR   LDGT1:"
"ENTER MYR AGES   1-10   FOR   LDGT2:"
"ENTER MYR AGES  11-20   FOR   LDGT2:"
"ENTER MYR AGES   1-10   FOR   HDGV:"
"ENTER MYR AGES  11-20   FOR   HDGV:"
"ENTER MYR AGES   1-10   FOR   LDDV:"
"ENTER MYR AGES  11-20   FOR   LDDV:"
"ENTER MYR AGES   1-10   FOR   LDDT:"
"ENTER MYR AGES  11-20   FOR   LDDT:"
"ENTER MYR AGES   1-10   FOR   HDDV:"
"ENTER MYR AGES  11-20   FOR   HDDV:"
"ENTER MYR AGES   1-10   FOR   MC:"
"ENTER MYR AGES  11-20   FOR   MC:"
```

3.3.6 Emission Factor Modification Data Prompts

If ALTFLG=1, the number of alternate emission rates to be input is prompted for by:

```
"ENTER NO. OF NEW E.F. INTERCEPT/SLOPE PAIRS (I2)"
```

Each emission rate is then prompted for by:

```
"ENTER REGION, VEH. TYPE, POLLUTANT, FIRST MY,
LAST MY, NEW INTERCEPT (A), AND NEW SLOPE (B)"
```

3.3.7 I/M Parameter Record Prompt

If IMFLG=1, five I/M parameters are prompted for by:

"ENTER YEAR I/M BEGINS, STRINGENCY, M.T. FLAG,
FIRST MODEL YEAR AND LAST MODEL YEAR OF PROG. BENEFITS"

If IMFLG=2, eight I/M parameters are prompted for by:

"ENTER YEAR I/M BEGINS, STRINGENCY, M.T. FLAG,
FIRST MODEL YEAR AND LAST MODEL YEAR OF PROG. BENEFITS
VEH. TYPE, OPTION, AND NEWDATA FLAG"

I/M credit data from unit 4 are not prompted for.

3.3.8 Trips/Day and Miles/Day Record Prompt

If ICEVFG = 1 or 2, trips/day for the 8 vehicle types are prompted for by:

"ENTER AVERAGE TRIPS/DAY"

and miles/day for the 8 vehicle types are prompted for by:

"ENTER AVERAGE MILES/DAY"

3.3.9 Scenario Record Prompt

If SPDFLG = 0, 7 parameters are prompted for by

"ENTER REGION, CY, SPD(1), TAMB, PCCN, PCHC, PCCC:"

while if SPDFLG=2, 14 parameters are prompted for by

"ENTER REGION, CY, SPD(8), TAMB, PCCN, PCHC, PCCC:".

The number following "SPD" in the prompt is the number of speed values to input.

3.3.10 Additional LD Correction Factors Record Prompt

If ALHFLG = 1, 6 values are prompted for by:

"ENTER AC, XLOAD(3), TRAILR(1), ABSHUM",

while if ALHFLG=2, 10 values are prompted for by:

"ENTER AC, XLOAD(3), TRAILR(3), ABSHUM, DBTEMP, WBTEMP".

The numbers in parentheses in the prompts represent the number of values of the particular parameter to be input.

3.3.11 HD Correction Factors Record Prompt

If TRKFLG=1, 4 power/weight correction factors for HDVs will be prompted for by:

"ENTER HGWGT, HDWGT, HGCID, HDCID (VALUES WILL BE IGNORED)"

It is recommended that TRKFLG = 0 always be used.

Chapter 4

MOBILE2 EXAMPLES

4.0 INTRODUCTION

This chapter contains several examples of MOBILE2 input streams and resulting outputs. The examples serve only to illustrate the various options and do not necessarily represent any "real world" situations.

Each example begins with an image of the input records. Below each input data set is an 80-column "ruler" to indicate the position of the fields within the record. Identifying comments have been placed in columns 81 and beyond of each record. Following the 80-column ruler is a discussion of the input, followed by the MOBILE2 outputs.

The first part of this chapter contains eight MOBILE2 examples. The second part contains the thirteen examples from the MOBILE1 User's Guide, modified as necessary to run through MOBILE2.

4.1 MOBILE2 EXAMPLES

Eight MOBILE2 examples are provided on the following pages. Each legitimate value of a CONTROL flag is exercised in at least one example.

4.1.1 MOBILE2 EXAMPLE # 1

```
Input Record  (80 columns)                                                        Description                        Section

0            IPROMT                                                               FLAG                               CONTROL
MOBILE2 EXAMPLE #1                                                                TITLE                              CONTROL
1            INFLAG                                                               FLAG                               CONTROL
0            SPDFLG                                                               FLAG                               CONTROL
0            VMFLAG                                                               FLAG                               CONTROL
0            MYMRFG                                                               FLAG                               CONTROL
0            ALTFLG                                                               FLAG                               CONTROL
0            IMFLG                                                                FLAG                               CONTROL
0            ALHFLG                                                               FLAG                               CONTROL
1            TRKFLG                                                               FLAG                               CONTROL
0            IFORM                                                                FLAG                               CONTROL
0            PRTFLG                                                               FLAG                               CONTROL
1            ICEVFG                                                               FLAG                               CONTROL
0            IDLFLG                                                               FLAG                               CONTROL
0            NMHFLG                                                               FLAG                               CONTROL
0            UNFFLG                                                               FLAG                               CONTROL
1 70  5.0  0.0  0.0 100.  0.0                                                     SCENARIO                           PARAMETER
  11.  11.  11.  11.                                                              HDV P/W CORR.FACTORS (IGNORED)     PARAMETER
1 85 15.0 50.0 37.1 50.0 50.0                                                     SCENARIO                           PARAMETER
  11.  11.  11.  11.                                                              HDV P/W CORR.FACTORS (IGNORED)     PARAMETER
2 85 15.0 50.0 37.1 50.0 50.0                                                     SCENARIO                           PARAMETER
  11.  11.  11.  11.                                                              HDV P/W CORR.FACTORS (IGNORED)     PARAMETER
3 85 15.0 50.0 37.1 50.0 50.0                                                     SCENARIO                           PARAMETER
  11.  11.   1.  11.                                                              HDV P/W CORR.FACTORS (IGNORED)     PARAMETER
1 00 55.0 110. 74.2  0.0 100.                                                     SCENARIO                           PARAMETER
  11.  11.  11.  11.                                                              HDV P/W CORR.FACTORS (IGNORED)     PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Example 1 uses a "vertical" input format without prompting (IPROMT=0) and a numeric output format for 6 vehicle types (LDDs not included, IFORM=0). All default output units are used since no values for IOUNEW are given. This example prints total crankcase and evaporative HC emissions (ICEVFG=1). HC emission factors include methane (NMHFLG=0).

An additional record for the HDV power/weight correction factor (TRKFLG=1) is required and is placed after each scenario record. This correction factor is no longer used, though the data requirement has been retained to enable MOBILE1 run streams to be used in MOBILE2. The contents of the record are ignored. Since the TRKFLG flag is non-zero, a warning message is produced.

```
WARNING: FLAG TRKFLG IGNORED.  "TRKOPC" NO LONGER USED.

MOBILE2 EXAMPLE #1

R                                              P
E          SPEEDS       AMB.                   O            COMPOSITE EMISSION FACTORS                          VEHICLE MIX               C.E.F.
G CY    LD    HD     MC  TMP   COLD/HOT  START L     LDV    LDT1    LDT2     HDG     HDD      MC   LDV  LDT1  LDT2   HDG   HDD    MC  ALL VEH
- -- -------------- ---  ---------------------- - ------------------------------------------------ ----------------------------------- -------
1 70  5.0/ 5.0/ 5.0    0    0.0  100.0     0.0 E    3.69    3.99    4.16    6.91     0.0    1.86 0.786 0.083 0.047 0.042 0.033 0.009
1 70  5.0/ 5.0/ 5.0    0    0.0  100.0     0.0 1   31.00   30.08   39.10  103.17    8.49   35.62 0.786 0.083 0.047 0.042 0.033 0.009   33 63
1 70  5.0/ 5.0/ 5.0    0    0.0  100.0     0.0 2  258.84  250.09  285.61  874.22   35.01  102.51 0.786 0.083 0.047 0.042 0.033 0.009  276.37
1 70  5.0/ 5.0/ 5.0    0    0.0  100.0     0.0 3    8.00    8.01   12.86   11.90   40.29    0.58 0.786 0.083 0.047 0.042 0.033 0.009    9.39
1 85 15.0/15.0/15.0   50   37.1   50.0    50.0 E    0.44    0.52    0.33    2.68     0.0    2.25 0.750 0.079 0.046 0.042 0.033 0.009
1 85 15.0/15.0/15.0   50   37.1   50.0    50.0 1    6.43    6.99    5.16   14.19    5.35    9.54 0.750 0.079 0.046 0.042 0.033 0.009    6.51
1 85 15.0/15.0/15.0   50   37.1   50.0    50.0 2   71.97   73.88   51.09  251.44   17.42   44.02 0.750 0.079 0.046 0.042 0.033 0.009   73.86
1 85 15.0/15.0/15.0   50   37.1   50.0    50.0 3    2.21    2.72    2.42   10.48   28.74    0.90 0.750 0.079 0.046 0.042 0.033 0.009    3.44
2 85 15.0/15.0/15.0   50   37.1   50.0    50.0 E    0.41    0.48    0.18    0.51     0.0    1.63 0.750 0.079 0.046 0.042 0.033 0.009
2 85 15.0/15.0/15.0   50   37.1   50.0    50.0 1    5.11    5.56    4.01    8.75    5.10    7.89 0.750 0.079 0.046 0.042 0.033 0.009    5.10
2 85 15.0/15.0/15.0   50   37.1   50.0    50.0 2   57.12   61.47   49.27  238.68   17.42   40.84 0.750 0.079 0.046 0.042 0.033 0.009   61.08
2 85 15.0/15.0/15.0   50   37.1   50.0    50.0 3    1.83    2.17    1.89    6.87   19.99    0.85 0.750 0.079 0.046 0.042 0.033 0.009    2.64
3 85 15.0/15.0/15.0   50   37.1   50.0    50.0 E    0.54    0.66    0.43    3.48     0.0    2.92 0.750 0.079 0.046 0.042 0.033 0.009
3 85 15.0/15.0/15.0   50   37.1   50.0    50.0 1    7.50    8.18    5.75   18.33   10.88   12.09 0.750 0.079 0.046 0.042 0.033 0.009    7.83
3 85 15.0/15.0/15.0   50   37.1   50.0    50.0 2  100.19   97.02   63.36  405.58   28.25   62.13 0.750 0.079 0.046 0.042 0.033 0.009  104.48
3 85 15.0/15.0/15.0   50   37.1   50.0    50.0 3    1.76    2.19    2.09    8.05   28.74    0.54 0.750 0.079 0.046 0.042 0.033 0.009    2.94
1  0 55.0/55.0/55.0  110   74.2    0.0   100.0 E    0.10    0.11    0.09    0.24     0.0    2.26 0.631 0.067 0.046 0.042 0.033 0.009
1  0 55.0/55.0/55.0  110   74.2    0.0   100.0 1    1.08    0.85    0.79    1.42    1.65    4.79 0.631 0.067 0.046 0.042 0.033 0.009    1.00
1  0 55.0/55.0/55.0  110   74.2    0.0   100.0 2   13.78    7.72    6.04   26.69    6.59    9.59 0.631 0.067 0.046 0.042 0.033 0.009   11.13
1  0 55.0/55.0/55.0  110   74.2    0.0   100.0 3    1.36    0.93    0.79    2.66    8.68    1.28 0.631 0.067 0.046 0.042 0.033 0.009    1.61
```

4.1.1 MOBILE2 EXAMPLE#1 Diagnostic and Report Output

4.1.2 MOBILE2 EXAMPLE # 2

Input Record (80 columns)

```
                                                     Description                        Section

2                                                    IPROMT FLAG                        CONTROL
MOBILE2 EXAMPLE #2                                   TITLE                              CONTROL
1 0 0 0 1 1 0 0 1 0 1 1 1 0                          FLAGS                              CONTROL
10                                                   ALTERNATE BASE EMISSION RATES      ONE-TIME
1 3 1 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 3 2 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 3 3 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 4 1 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 4 2 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 4 3 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 5 1 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 5 2 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 5 3 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
1 6 1 51 00   1.00   0.00                            ALTERNATE BASE EMISSION RATES      ONE-TIME
85 44 0 75 90                                        I/M DATA                           ONE-TIME
1 70  5.0  0.0  0.0 100.  0.0                        SCENARIO                           PARAMETER
1 85 15.0 50.0 37.1 50.0 50.0                        SCENARIO                           PARAMETER
2 85 15.0 50.0 37.1 50.0 50.0                        SCENARIO                           PARAMETER
3 85 15.0 50.0 37.1 50.0 50.0                        SCENARIO                           PARAMETER
1 00 55.0 110. 74.2  0.0 100.                        SCENARIO                           PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Example 2 uses "horizontal" input format without prompting (IPROMT=2) and a descriptive output for 6 vehicle types (LDDs excluded, IFORM=1). All defaults output units are used since no values for IOUNEW are given.

Input options are as follows:
- alternate basic emission rates (ALTFLG=1)
- I/M program in effect, using MOBILE2 I/M credits (IMFLG=1)

These option require data inputs.

The following output options are in effect:
- print total crankcase and evaporative HC emissions (ICEVFG=1)
- print idle emissions (IDLFLG=1)
- print non-methane HC emissions (NMHFLG=1)

Warning messages are generated to indicate that idle emission rates are zeroed for the corresponding basic emission rates.

```
WARNING: EQUATION  1 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=3, IP=1
WARNING: EQUATION  2 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=3, IP=2
WARNING: EQUATION  3 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=3, IP=3
WARNING: EQUATION  4 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=4, IP=1
WARNING: EQUATION  5 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=4, IP=2
WARNING: EQUATION  6 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=4, IP=3
WARNING: EQUATION  7 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=1
WARNING: EQUATION  8 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=2
WARNING: EQUATION  9 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=3
WARNING: EQUATION 10 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=6, IP=1


MOBILE2 EXAMPLE #2

   EMISSION FACTOR MODIFICATION PROFILE:
REGION  VEH.  POLLUTANT  FIRST MY  LAST MY    BASE    DR   ALTERED
------  ----  ---------  --------  -------    ----   ---   -------
   1      3       1        1951     2000      1.00   0.0     YES
   1      3       2        1951     2000      1.00   0.0     YES
   1      3       3        1951     2000      1.00   0.0     YES
   1      4       1        1951     2000      1.00   0.0     YES
   1      4       2        1951     2000      1.00   0.0     YES
   1      4       3        1951     2000      1.00   0.0     YES
   1      5       1        1951     2000      1.00   0.0     YES
   1      5       2        1951     2000      1.00   0.0     YES
   1      5       3        1951     2000      1.00   0.0     YES
   1      6       1        1951     2000      1.00   0.0     YES

  *NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
--------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1970     TEMP:  0.0(F)        0.786/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE     5.0/ 5.0/ 5.0 MPH ( 5.0)  0.0/100.0/  0.0
 LDGV I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                      COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV      LDT1     LDT2      HDG      HDD       MC    ALL MODES
NON-METH HC:     29.08    28.26     7.51    11.25     8.15    33.60     26.61
   *EVAP HC:      3.69     3.99     4.16     6.91     0.0      1.86      ----
EXHAUST  CO:    258.84   250.09     2.99     3.31    35.01   102.51    226.61
EXHAUST NOX:      8.00     8.01     2.32     1.34    40.29     0.58      8.45

                  HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:      1.34     1.29     0.0      0.0      0.35     2.07      0.0
   IDLE  CO:     16.42    16.07     0.0      0.0      0.89     4.47      0.0
   IDLE NOX:      0.11     0.12     0.0      0.0      0.92     0.01      0.0
--------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 50.0(F)        0.750/0.079/0.046/0.042/0.033/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 37.1/ 50.0/ 50.0
 LDGV I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.
```

4.1.2 MOBILE2 EXAMPLE#2 Diagnostic and Report Output

```
                         COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1       LDT2       HDG       HDD        MC    ALL MODES
NON-METH HC:     5.53       6.23       2.57      4.07      5.13      8.96      5.24
   *EVAP HC:     0.44       0.52       0.33      2.68      0.0       2.25      ----
EXHAUST  CO:    71.97      73.88       2.68      1.43     17.42     44.02     61.09
EXHAUST NOX:     2.21       2.72       1.11      0.99     28.74      0.90      2.98

                 HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:     0.52       0.38       0.0       0.0       0.35      0.78      0.0
   IDLE  CO:     9.55       6.49       0.0       0.0       0.89      2.57      0.0
   IDLE NOX:     0.18       0.07       0.0       0.0       0.92      0.04      0.0
-----------------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 50.0(F)         0.750/0.079/0.046/0.042/0.033/0.009
 REGION:   CALIF.    15.0/15.0/15.0 MPH (15.0) 37.1/ 50.0/ 50.0
 LDGV I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1       LDT2       HDG       HDD        MC    ALL MODES
NON-METH HC:     4.30       4.79       3.26      8.14      4.90      7.36      4.35
   *EVAP HC:     0.41       0.48       0.18      0.51      0.0       1.63      ----
EXHAUST  CO:    57.12      61.47      49.27    238.68     17.42     40.84     61.08
EXHAUST NOX:     1.83       2.17       1.89      6.87     19.99      0.85      2.64

                 HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:     0.24       0.27       0.18      0.39      0.32      0.67      0.24
   IDLE  CO:     2.72       5.82       4.38      7.23      0.89      2.50      3.07
   IDLE NOX:     0.05       0.07       0.02      0.04      0.60      0.04      0.07
-----------------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 50.0(F)         0.750/0.079/0.046/0.042/0.033/0.009
 REGION:  HI-ALT.    15.0/15.0/15.0 MPH (15.0) 37.1/ 50.0/ 50.0
 LDGV I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1       LDT2       HDG       HDD        MC    ALL MODES
NON-METH HC:     6.41       7.29       5.13     17.23     10.45     11.36      6.85
   *EVAP HC:     0.54       0.66       0.43      3.48      0.0       2.92      ----
EXHAUST  CO:   100.19      97.02      63.36    405.58     28.25     62.13    104.48
EXHAUST NOX:     1.76       2.19       2.09      8.05     28.74      0.54      2.94

                 HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:     0.39       0.37       0.22      0.61      0.80      0.95      0.40
   IDLE  CO:     8.15       6.79       3.59      8.07      1.39      2.76      7.24
   IDLE NOX:     0.06       0.04       0.05      0.04      0.92      0.02      0.09
-----------------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 2000     TEMP:110.0(F)         0.631/0.067/0.046/0.042/0.033/0.009
 REGION: 49-STATE    55.0/55.0/55.0 MPH (55.0) 74.2/  0.0/100.0
 LDGV I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
```

4.1.2 MOBILE2 EXAMPLE#2 Diagnostic and Report Output (cont.)

```
I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
  I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                    COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV     LDT1     LDT2     HDG      HDD      MC    ALL MODES
NON-METH HC:     0.72    0.65     0.83     0.48     1.58     4.59    0.75
   *EVAP HC:     0.10    0.11     0.09     0.24     0.0      2.26    ----
EXHAUST  CO:    12.79    7.72     0.83     0.69     6.59     9.59    9.11
EXHAUST NOX:     1.36    0.93     0.92     0.66     8.68     1.28    1.52

                 HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:     0.24    0.07     0.0      0.0      0.26     0.76    0.0
   IDLE  CO:     6.77    1.39     0.0      0.0      0.89     2.50    0.0
   IDLE NOX:     0.14    0.02     0.0      0.0      0.23     0.04    0.0
------------------------------------------------------------------------------
```

4.1.2 MOBILE2 EXAMPLE#2 Diagnostic and Report Output (cont.)

4.1.3 MOBILE2 EXAMPLE # 3

```
Input Record  (80 columns)                                 Description            Section

0666        IPROMT,IDUNEW(1)...IDUNEW(3)                   FLAG                   CONTROL
MOBILE2 EXAMPLE #3                                         TITLE                  CONTROL
1           INFLAG                                         FLAG                   CONTROL
0           SPDFLG                                         FLAG                   CONTROL
0           VMFLAG                                         FLAG                   CONTROL
0           MYMRFG                                         FLAG                   CONTROL
0           ALTFLG                                         FLAG                   CONTROL
0           IMFLG                                          FLAG                   CONTROL
0           ALHFLG                                         FLAG                   CONTROL
0           TRKFLG                                         FLAG                   CONTROL
2           IFORM                                          FLAG                   CONTROL
0           PRTFLG                                         FLAG                   CONTROL
3           ICEVFG                                         FLAG                   CONTROL
0           IDLFLG                                         FLAG                   CONTROL
0           NMHFLG                                         FLAG                   CONTROL
0           UNFFLG                                         FLAG                   CONTROL
  3.1  3.1  3.1 10.0  0.0  1.0  1.0  1.0                   TRIPS/DAY              ONE-TIME
 31.1 26.3 33.7 100.  0.0  1.0  1.0  1.0                   MILES/DAY              ONE-TIME
1 70  5.0  0.0  0.0 100.  0.0                              SCENARIO               PARAMETER
1 85 15.0 50.0 37.1 50.0 50.0                              SCENARIO               PARAMETER
2 85 15.0 50.0 37.1 50.0 50.0                              SCENARIO               PARAMETER
3 85 15.0 50.0 37.1 50.0 50.0                              SCENARIO               PARAMETER
1 00 55.0 110. 74.2  0.0 100.                              SCENARIO               PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Example 3 uses the "vertical" input format without prompting (IPROMT=0) and a numeric output format for 9 vehicle types (including a combined LDGT group, IFORM=2). Output units are assigned in IOUNEW and are set to the default values.

The input option used in this example is to supply data for average number of trips per day and average miles travelled per day. These values are used in the crankcase and evaporative HC emission calculations which are printed in the output (ICEVFG=3). HC emission factors include methane (NMHFLG=0).

```
COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE IOUUNF=9 IOUREP=6 IOUERR=6 IOUASK=6


MOBILE2 EXAMPLE #3

C R   *CODE A*
D E                                                   AMB.
D G CY              VEHICLE SPEEDS                    TMP   COLD/HOT START    ALT.
- - -- ---------------------------------------------- ---  ---------------  ------

C P   *CODE B*
D O                COMPOSITE EMISSION FACTORS
D L  LDGV    LDGT1  LDGT2  LDGT   HDGV   LDDV   LDDT   HDDV   MC
- -  ----------------------------------------------------------------


C     *CODE C*
D                       VEHICLE MIX                   C.E.F.
D LDGV  LDGT1 LDGT2 HDGV  LDDV  LDDT  HDDV  MC     ALL VEH
- ----------------------------------------------   -------
A 1 70  5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0   0    0.0 100.0   0.0   500.
B E   3.72   4.01   4.18   4.07   5.25   0.0    0.0    0.0   11.58
C 0.786 0.083 0.047 0.042 0.0    0.0   0.033 0.009
A 1 70  5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0   0    0.0 100.0   0.0   500.
B 1  31.02  30.11  39.12  33.35 101.51   0.0    0.0    8.49  45.34
C 0.786 0.083 0.047 0.042 0.0    0.0   0.033 0.009  33.67
A 1 70  5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0   0    0.0 100.0   0.0   500.
B 2 258.84 250.09 285.61 262.85 874.22   0.0    0.0   35.01 102.51
C 0.786 0.083 0.047 0.042 0.0    0.0   0.033 0.009 276.37
A 1 70  5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0/ 5.0   0    0.0 100.0   0.0   500.
B 3   8.00   8.01  12.86   9.75  11.90   0.0    0.0   40.29   0.58
C 0.786 0.083 0.047 0.042 0.0    0.0   0.033 0.009   9.39
A 1 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B E   0.44   0.52   0.33   0.45   1.33   0.0    0.0    0.0   16.02
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009
A 1 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B 1   6.44   7.00   5.16   6.32  12.84   0.73   1.32   5.35  23.31
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009   6.59
A 1 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B 2  71.97  73.88  51.09  65.48 251.44   2.74   4.23  17.42  44.02
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009  73.86
A 1 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B 3   2.21   2.72   2.42   2.61  10.48   1.42   2.45  28.74   0.90
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009   3.44
A 2 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B E   0.41   0.48   0.18   0.37   0.25   0.0    0.0    0.0   11.66
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009
A 2 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B 1   5.11   5.56   4.02   4.99   8.49   0.73   0.82   5.10  17.92
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009   5.18
A 2 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B 2  57.12  61.47  49.27  56.97 238.68   2.74   2.81  17.42  40.84
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009  61.08
A 2 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0   500.
B 3   1.83   2.17   1.89   2.07   6.87   1.31   1.76  19.99   0.85
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009   2.64
A 3 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0  5500.
B E   0.55   0.66   0.43   0.58   1.73   0.0    0.0    0.0   20.83
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009
A 3 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50   37.1  50.0  50.0  5500.
B 1   7.51   8.18   5.76   7.29  16.58   1.06   2.37  10.88  29.99
```

4.1.3 MOBILE2 EXAMPLE#3 Diagnostic and Report Output

```
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009    7.93
A 3 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50  37.1  50.0  50.0  5500.
B 2 100.19  97.02  63.36  84.61 405.58   3.91   5.94  28.25  62.13
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009 104.48
A 3 85 15.0/15.0/15.0/15.0/15.0/15.0/15.0/15.0  50  37.1  50.0  50.0  5500.
B 3   1.76   2.19   2.08   2.15   8.05   1.42   2.45  28.74   0.54
C 0.750 0.079 0.046 0.042 0.036 0.005 0.033 0.009    2.94
A 1  0 55.0/55.0/55.0/55.0/55.0/55.0/55.0/55.0 110  74.2   0.0 100.0   500.
B E   0.10   0.11   0.08   0.10   0.12   0.0    0.0    0.0   16.13
C 0.631 0.067 0.046 0.042 0.153 0.018 0.033 0.009
A 1  0 55.0/55.0/55.0/55.0/55.0/55.0/55.0/55.0 110  74.2   0.0 100.0   500.
B 1   1.09   0.85   0.79   0.82   1.30   0.36   0.61   1.65  18.66
C 0.631 0.067 0.046 0.042 0.153 0.018 0.033 0.009    1.13
A 1  0 55.0/55.0/55.0/55.0/55.0/55.0/55.0/55.0 110  74.2   0.0 100.0   500.
B 2  13.78   7.72   6.04   7.03  26.69   1.21   1.92   6.50   9.59
C 0.631 0.067 0.046 0.042 0.153 0.018 0.033 0.009   11.13
A 1  0 55.0/55.0/55.0/55.0/55.0/55.0/55.0/55.0 110  74.2   0.0 100.0   500.
B 3   1.36   0.93   0.79   0.87   2.66   1.44   1.39   8.68   1.28
C 0.631 0.067 0.046 0.042 0.153 0.018 0.033 0.009    1.61
```

4.1.3 MOBILE3 EXAMPLE#3 Diagnostic and Report Output (cont.)

4.1.4 MOBILE2 EXAMPLE # 4

```
Input Record  (80 columns)                                Description                       Section

17          IPROMT,IOUNEW(1)                              FLAG                              CONTROL
MOBILE2 EXAMPLE #4                                        TITLE                             CONTROL
1           INFLAG                                        FLAG                              CONTROL
0           SPDFLG                                        FLAG                              CONTROL
1           VMFLAG                                        FLAG                              CONTROL
1           MYMRFG                                        FLAG                              CONTROL
0           ALTFLG                                        FLAG                              CONTROL
0           IMFLG                                         FLAG                              CONTROL
1           ALHFLG                                        FLAG                              CONTROL
0           TRKFLG                                        FLAG                              CONTROL
3           IFORM                                         FLAG                              CONTROL
0           PRTFLG                                        FLAG                              CONTROL
1           ICEVFG                                        FLAG                              CONTROL
1           IDLFLG                                        FLAG                              CONTROL
1           NMHFLG                                        FLAG                              CONTROL
0           UNFFLG                                        FLAG                              CONTROL
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDGV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDGV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDGT1  AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDGT1  AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDGT2  AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDGT2  AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  HDGV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  HDGV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDDV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDDV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDDT   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  LDDT   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  HDDV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  HDDV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  MC     AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050        MYM  MC     AGES 11-20            ONE-TIME
1 70  5.0 80.0  0.0 100.   0.0                            SCENARIO                          PARAMETER
.784.084.047.042.000.000.035.008                          VMT MIX                           PARAMETER
.100.050.070.090.04060.0                                  LD ADDITIONAL CORRECTION FACTORS  PARAMETER
1 85 15.0 80.0 37.1 50.0 50.0                             SCENARIO                          PARAMETER
.782.082.047.042.002.001.035.009                          VMT MIX                           PARAMETER
.100.050.070.090.04060.0                                  LD ADDITIONAL CORRECTION FACTORS  PARAMETER
2 85 15.0 80.0 37.1 50.0 50.0                             SCENARIO                          PARAMETER
.200.200.200.200.200.000.000.000                          VMT MIX                           PARAMETER
.100.050.070.090.04060.0                                  LD ADDITIONAL CORRECTION FACTORS  PARAMETER
3 85 15.0 80.0 37.1 50.0 50.0                             SCENARIO                          PARAMETER
.700.075.040.015.015.035.120.000                          VMT MIX                           PARAMETER
.100.050.070.090.04060.0                                  LD ADDITIONAL CORRECTION FACTORS  PARAMETER
1 00 55.0 80.0 74.2  0.0 100.                             SCENARIO                          PARAMETER
.700.075.040.015.015.035.120.000                          VMT MIX                           PARAMETER
.100.050.070.090.04060.0                                  LD ADDITIONAL CORRECTION FACTORS  PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.4 MOBILE2 EXAMPLE#4 Input

Example 4 uses a "vertical" input format with prompting (IPROMT=1) and a wide descriptive format for 9 vehicle types (including a combined LDGT group, IFORM=3). The formatted reports are sent to unit 7 (IOUNEW(1)=7). All other outputs are sent to their default units. As can be seen in the output, all prompting and diagnostic messages are printed separate from the formatted output report.

The input options used in this example are:
- user supplied VMT mix for each scenario (VMFLAG=1)
- use of four additional correction factors for light-duty vehicles and trucks. The user supplies one factor for air conditioning use, three usage fractions for vehicles with extra load (LDGV, LDGT1, LDGT2), one usage fraction for LDGVs and LDGTs towing a trailer, and one humidity level (ALHFLG=1)
- user supplied annual mileage accumulation rates for twenty years and eight vehicle types (MYMRFG=1).

The output options used in this example are:
- print total crankcase and evaporative HC emissions (ICEVFG=1)
- print idle emission factors (IDLFLG=1)
- print non-methane HC emissions (NMHFLG=1)

4.1.4 MOBILE2 EXAMPLE#4 Input (cont.)

```
ENTER PROJECT ID:


MOBILE2 EXAMPLE #4
COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE IOUUNF=9 IOUREP=7 IOUERR=6 IOUASK=6
ENTER INFLAG:
ENTER SPDFLG:
ENTER VMFLAG:
ENTER MYMRFG:
ENTER ALTFLG:
ENTER IMFLG:
ENTER ALHFLG:
ENTER TRKFLG:
ENTER IFORM:
ENTER PRTFLG:
ENTER ICEVFG:
ENTER IDLFLG:
ENTER NMHFLG:
ENTER UNFFLG:


ENTER MYM AGES 1-10 FOR LDGV:
ENTER MYM AGES 11-20 FOR LDGV:
ENTER MYM AGES 1-10 FOR LDGT1:
ENTER MYM AGES 11-20 FOR LDGT1:
ENTER MYM AGES 1-10 FOR LDGT2:
ENTER MYM AGES 11-20 FOR LDGT2:
ENTER MYM AGES 1-10 FOR HDGV:
ENTER MYM AGES 11-20 FOR HDGV:
ENTER MYM AGES 1-10 FOR LDDV:
ENTER MYM AGES 11-20 FOR LDDV:
ENTER MYM AGES 1-10 FOR LDDT:
ENTER MYM AGES 11-20 FOR LDDT:
ENTER MYM AGES 1-10 FOR HDDV:
ENTER MYM AGES 11-20 FOR HDDV:
ENTER MYM AGES 1-10 FOR MC:
ENTER MYM AGES 11-20 FOR MC:
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.500E-01 MILEAGE WITH ZERO REGISTRATION

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
```

4.1.4 MOBILE2 EXAMPLE#4 Prompting and Diagnostic Output

```
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
```

4.1.4 MOBILE2 EXAMPLE#4 Prompting and Diagnostic Output (cont.)

```
MOBILE2 EXAMPLE #4

  *NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1970     REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB: 80.0(F)        0.0/100.0/  0.0
                                             AC (DB/WB):  0.9 ( 85.0/ 75.0)      ABSHUM: 60.00

  VEH. TYPE:       LDGV     LDGT1     LDGT2     LDGT      HDGV      LDDV      LDDT      HDDV      MC    ALL VEH.
VEH. SPEEDS:       5.0      5.0       5.0                 5.0       5.0       5.0       5.0       5.0
    VMT MIX:       0.784    0.084     0.047               0.042     0.0       0.0       0.035     0.008
 EXTRA LOAD:       0.050    0.070     0.090
TRLR IN TOW:       0.040    0.040     0.040

COMPOSITE EMISSION FACTORS (GM/MILE)
NON-METH HC:      26.79    27.54     35.51     30.40     63.84      0.0       0.0       6.67     34.52     28.17
   *EVAP HC:       3.97     4.50      4.77      4.60      7.57      0.0       0.0       0.0       1.86      ----
EXHAUST  CO:     278.77   287.80    335.37    304.87    701.14      0.0       0.0      29.72    120.69    289.95
EXHAUST NOX:       5.82     5.93      9.36      7.16      7.71      0.0       0.0      36.54      0.50      7.11

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:       1.25     1.25      1.55      1.36      2.24      0.0       0.0       0.35      2.57      1.28
   IDLE  CO:      14.95    15.04     19.02     16.47     23.72      0.0       0.0       0.70      4.76     14.94
   IDLE NOX:       0.11     0.11      0.08      0.10      0.04      0.0       0.0       0.92      0.01      0.13
-------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1985     REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB: 80.0(F)       37.1/ 50.0/ 50.0
                                             AC (DB/WB):  0.9 ( 85.0/ 75.0)      ABSHUM: 60.00

  VEH. TYPE:       LDGV     LDGT1     LDGT2     LDGT      HDGV      LDDV      LDDT      HDDV      MC    ALL VEH.
VEH. SPEEDS:      15.0     15.0      15.0                15.0      15.0      15.0      15.0      15.0
    VMT MIX:       0.782    0.082     0.047               0.042     0.002     0.001     0.035     0.009
 EXTRA LOAD:       0.050    0.070     0.090
TRLR IN TOW:       0.040    0.040     0.040

COMPOSITE EMISSION FACTORS (GM/MILE)
NON-METH HC:       3.80     4.99      4.28      4.73     13.57      0.61      1.05      4.20     11.08      4.40
   *EVAP HC:       0.54     0.75      0.52      0.66      2.97      0.0       0.0       0.0       2.19      ----
EXHAUST  CO:      55.69    64.31     49.01     58.74    227.81      2.53      3.87     14.79     43.56     61.61
EXHAUST NOX:       2.43     3.11      2.91      3.04      9.62      1.32      2.29     26.06      0.84      3.62

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:       0.38     0.39      0.27      0.35      0.65      0.03      0.09      0.35      1.41      0.40
   IDLE  CO:       7.24     6.83      3.75      5.71      7.20      0.16      0.32      0.70      3.25      6.75
   IDLE NOX:       0.16     0.08      0.06      0.07      0.06      0.13      0.33      0.92      0.03      0.17
-------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1985     REGION: CALIF. LOWALT.        ALT:  500. FT.      TAMB: 80.0(F)       37.1/ 50.0/ 50.0
                                             AC (DB/WB):  0.9 ( 85.0/ 75.0)      ABSHUM: 60.00

  VEH. TYPE:       LDGV     LDGT1     LDGT2     LDGT      HDGV      LDDV      LDDT      HDDV      MC    ALL VEH.
VEH. SPEEDS:      15.0     15.0      15.0                15.0      15.0      15.0      15.0      15.0
    VMT MIX:       0.200    0.200     0.200               0.200     0.200     0.0       0.0       0.0
 EXTRA LOAD:       0.050    0.070     0.090
TRLR IN TOW:       0.040    0.040     0.040

COMPOSITE EMISSION FACTORS (GM/MILE)
NON-METH HC:       2.93     3.90      2.85      3.37      8.49      0.61      0.0       0.0       0.0       3.75
   *EVAP HC:       0.50     0.69      0.27      0.48      0.82      0.0       0.0       0.0       0.0       ----
EXHAUST  CO:      42.20    52.71     45.94     49.33    215.80      2.53      0.0       0.0       0.0      71.83
```

4.1.4 MOBILE2 EXAMPLE#4 Report Output

```
EXHAUST NOX:       2.06      2.59      2.42      2.50      7.06      1.21      0.0       0.0       0.0       3.07

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:       0.19      0.27      0.20      0.24      0.45      0.03      0.0       0.0       0.0       0.23
   IDLE  CO:       2.44      5.36      4.24      4.80      6.87      0.16      0.0       0.0       0.0       3.82
   IDLE NOX:       0.05      0.07      0.03      0.05      0.05      0.12      0.0       0.0       0.0       0.06
----------------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1985      REGION: 49-STATE HIALT.       ALT: 5500. FT.      TAMB: 80.0(F)      37.1/ 50.0/ 50.0
                                           AC (DB/WB):  0.9 ( 85.0/ 75.0)      ABSHUM: 60.00

  VEH. TYPE:       LDGV      LDGT1     LDGT2     LDGT      HDGV      LDDV      LDDT      HDDV      MC     ALL VEH.
VEH. SPEEDS:      15.0      15.0      15.0                15.0      15.0      15.0      15.0      15.0
    VMT MIX:       0.700     0.075     0.040               0.015     0.015     0.035     0.120     0.0
 EXTRA LOAD:       0.050     0.070     0.090
TRLR IN TOW:       0.040     0.040     0.040

COMPOSITE EMISSION FACTORS (GM/MILE)
NON-METH HC:       4.66      6.16      4.95      5.74     17.87      0.94      2.06      9.52      0.0       5.42
   *EVAP HC:       0.68      0.95      0.67      0.85      3.86      0.0       0.0       0.0       0.0       ----
EXHAUST  CO:      84.52     91.33     64.91     82.14    392.30      3.74      5.64     25.62      0.0      77.82
EXHAUST NOX:       1.79      2.29      2.27      2.29      6.95      1.32      2.29     26.06      0.0       4.85

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:       0.32      0.39      0.29      0.35      0.69      0.05      0.18      0.80      0.0       0.38
   IDLE  CO:       6.82      7.16      4.24      6.14      7.97      0.24      0.47      1.20      0.0       5.76
   IDLE NOX:       0.05      0.04      0.05      0.04      0.04      0.13      0.33      0.92      0.0       0.17
----------------------------------------------------------------------------------------------------------------

 CAL. YEAR: 2000      REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB: 80.0(F)      74.2/  0.0/100.0
                                           AC (DB/WB):  0.9 ( 85.0/ 75.0)      ABSHUM: 60.00

  VEH. TYPE:       LDGV      LDGT1     LDGT2     LDGT      HDGV      LDDV      LDDT      HDDV      MC     ALL VEH.
VEH. SPEEDS:      55.0      55.0      55.0                55.0      55.0      55.0      55.0      55.0
    VMT MIX:       0.700     0.075     0.040               0.015     0.015     0.035     0.120     0.0
 EXTRA LOAD:       0.050     0.070     0.090
TRLR IN TOW:       0.040     0.040     0.040

COMPOSITE EMISSION FACTORS (GM/MILE)
NON-METH HC:       0.55      0.58      0.51      0.55      0.74      0.28      0.47      1.23      0.0       0.63
   *EVAP HC:       0.10      0.11      0.09      0.11      0.30      0.0       0.0       0.0       0.0       ----
EXHAUST  CO:      16.39     10.49      8.37      9.75     14.29      1.07      1.70      5.59      0.0      13.56
EXHAUST NOX:       2.99      2.21      1.94      2.11      4.03      1.21      1.21      7.30      0.0       3.34

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:       0.14      0.05      0.04      0.05      0.13      0.03      0.10      0.26      0.0       0.14
   IDLE  CO:       3.91      0.99      0.67      0.88      1.08      0.18      0.34      0.70      0.0       2.95
   IDLE NOX:       0.11      0.02      0.02      0.02      0.01      0.12      0.16      0.24      0.0       0.12
----------------------------------------------------------------------------------------------------------------
```

4.1.4 MOBILE2 EXAMPLE#4 Report Output (cont.)

4.1.5 MOBILE2 EXAMPLE # 5

```
Input Record  (80 columns)                                          Description                       Section

3ABC                                                                FLAG                              CONTROL
MOBILE2 EXAMPLE #5                                                  TITLE                             CONTROL
1 2 2 2 1 2 2 0 4 0 3 1 1 0                                         FLAGS                             CONTROL
.200.200.200.200.200.000.000.000                                    VMT MIX                           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  LD V    AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  LD V    AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  LD T1   AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  LD T1   AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  LDGT2   AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  LDGT2   AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  HDGV    AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  HDGV    AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  LD V    AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  LD V    AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  LD T1   AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  LD T1   AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  HDDV    AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  HDDV    AGES 11-20           ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                  MYR  MC      AGES  1-10           ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                  MYR  MC      AGES 11-20           ONE-TIME
10                                                                  ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 3 1 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 3 2 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 3 3 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 4 1 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 4 2 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 4 3 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 5 1 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 5 2 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 5 3 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
1 6 1 51 00   1.00   0.00                                           ALTERNATE BASIC EMISSION RATES    ONE-TIME
85 44 0 75 90 1 60 0                                                I/M DATA                          ONE-TIME
  3.1  3.1  3.1 10.0  0.0  1.0  1.0  1.0                            TRIPS/DAY                         ONE-TIME
 31.1 26.3 33.7 100.  0.0  1.0  1.0  1.0                            MILES/DAY                         ONE-TIME
1 75  5.0  5.0  5.0  5.0  5.0  5.0  5.0  5.0 80.0  0.0 100.  0.0    SCENARIO                          PARAMETER
.100.050.070.090.040.030.02060.080.075.0                            LD ADDITIONAL CORRECTION FACTORS  PARAMETER
1 85  5.0 15.0 25.0 35.0 45.0 55.0 50.0 20.0 80.0 37.1 50.0 50.0    SCENARIO                          PARAMETER
.100.050.070.090.040.030.02060.080.075.0                            LD ADDITIONAL CORRECTION FACTORS  PARAMETER
2 85  5.0 15.0 25.0 35.0 45.0 55.0 50.0 20.0 80.0 37.1 50.0 50.0    SCENARIO                          PARAMETER
.100.050.070.090.040.030.02060.080.075.0                            LD ADDITIONAL CORRECTION FACTORS  PARAMETER
3 85  5.0 15.0 25.0 35.0 45.0 55.0 50.0 20.0 80.0 37.1 50.0 50.0    SCENARIO                          PARAMETER
.100.050.070.090.040.030.02060.080.075.0                            LD ADDITIONAL CORRECTION FACTORS  PARAMETER
1 00 55.0 55.0 55.0 55.0 55.0 55.0 55.0 55.0 80.0 74.2  0.0 100.    SCENARIO                          PARAMETER
.100.050.070.090.040.030.02060.080.075.0                            LD ADDITIONAL CORRECTION FACTORS  PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Example 5 uses a "horizontal" input format with prompting (IPROMT=3) and an 80 column wide descriptive format for 9 vehicle types (including a combined LDGT group, IFORM=4). The formatted results and messages are sent to their default values since "A", "B", and "C" are illegal values for IOUNEW(1), IOUNEW(2), and IOUNEW(3). The output unit numbers are displayed in the output.

The input options used in this example are:

- eight average speeds, one per vehicle type (SPDFLG=2)
- one-time user supplied VMT mix (VMFLAG=2)
- user supplied annual vehicle registration distribution for twenty years and eight vehicle types (MYMRFG=2)
- user supplied alternative basic emission rates (ALTFLG=1)
- a LDGV and LDGT1 I/M program with a 60 percent Technology IV identification rate (IMFLG=2)
- the use of four additional correction factors for light duty vehicles and trucks. The user supplies one factor for air conditioning use, three extra load usage fractions (LDGV, LDGT1, LDGT2), three usage fractions for vehicles towing a trailer (LDGV, LDGT1, LDGT2), one humidity level, one dry bulb temperature, and one wet bulb temperature (ALHFLG=2)
- user supplied trips/day and miles/day (ICEVFG=3).

The output options used in this example are:

- print total crankcase and evaporative HC emissions (ICEVFG=3)
- print idle emission factors (IDLFLG=1)
- print non-methane HC emissions (NMHFLG=1)

4.1.5 MOBILE2 EXAMPLE#5 Input (cont.)

```
ENTER PROJECT ID:
ENTER INFLAG, SPDFLG, VMFLAG, MYMRFG, ALTFLG, IMFLG, ALHFLG,
TRKFLG, IFORM, PRTFLG, ICEVFG, IDLFLG, NMHFLG, & UNFFLG

ENTER VMT SPLIT:

ENTER MYR AGES 1-10 FOR LDGV:
ENTER MYR AGES 11-20 FOR LDGV:
ENTER MYR AGES 1-10 FOR LDGT1:
ENTER MYR AGES 11-20 FOR LDGT1:
ENTER MYR AGES 1-10 FOR LDGT2:
ENTER MYR AGES 11-20 FOR LDGT2:
ENTER MYR AGES 1-10 FOR HDGV:
ENTER MYR AGES 11-20 FOR HDGV:
ENTER MYR AGES 1-10 FOR LDDV:
ENTER MYR AGES 11-20 FOR LDDV:
ENTER MYR AGES 1-10 FOR LDDT:
ENTER MYR AGES 11-20 FOR LDDT:
ENTER MYR AGES 1-10 FOR HDDV:
ENTER MYR AGES 11-20 FOR HDDV:
ENTER MYR AGES 1-10 FOR MC:
ENTER MYR AGES 11-20 FOR MC:
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.200E-01 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.700E-01 REGISTRATION WITH ZERO MILEAGE

ENTER NO. OF NEW E.F. INTERCEPT/SLOPE PAIRS (I2)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
WARNING: EQUATION  1 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=3, IP=1
WARNING: EQUATION  2 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=3, IP=2
WARNING: EQUATION  3 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=3, IP=3
WARNING: EQUATION  4 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=4, IP=1
WARNING: EQUATION  5 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=4, IP=2
WARNING: EQUATION  6 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=4, IP=3
WARNING: EQUATION  7 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=1
```

4.1.5 MOBILE2 EXAMPLE#5 Prompting, Diagnostic, and Report Output

```
WARNING: EQUATION  8 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=2
WARNING: EQUATION  9 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=3
WARNING: EQUATION 10 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=6, IP=1

ENTER YEAR I/M BEGINS, STRINGENCY, M.T. FLAG,
FIRST MODEL YEAR AND LAST MODEL YEAR OF PROG. BENEFITS
VEH.TYPE,OPTION,AND NEWDATA FLAG

ENTER AVERAGE TRIPS/DAY

ENTER AVERAGE MILES/DAY

ENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.


MOBILE2 EXAMPLE #5

   EMISSION FACTOR MODIFICATION PROFILE:
REGION  VEH.  POLLUTANT  FIRST MY  LAST MY    BASE    DR   ALTERED
------  ----  ---------  --------  -------    ----   ---   -------
  1      3       1         1951     2000      1.00   0.0     YES
  1      3       2         1951     2000      1.00   0.0     YES
  1      3       3         1951     2000      1.00   0.0     YES
  1      4       1         1951     2000      1.00   0.0     YES
  1      4       2         1951     2000      1.00   0.0     YES
  1      4       3         1951     2000      1.00   0.0     YES
  1      5       1         1951     2000      1.00   0.0     YES
  1      5       2         1951     2000      1.00   0.0     YES
  1      5       3         1951     2000      1.00   0.0     YES
  1      6       1         1951     2000      1.00   0.0     YES

   *NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
---------------------------------------------------------------------------------

 CAL. YEAR: 1975      REGION: 49-STATE LOWALT.           ALT:  500. FT.
                        TAMB: 80.0(F)          0.0/100.0/  0.0
              AC (DB/WB):  0.7 ( 80.0/ 75.0)    ABSHUM: 60.00
 LDGV, LDGT1 I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN CHANGED TO 60%

VEH. TYPE:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV   MC    ALL VEH
VEH. SPD.:  5.0    5.0    5.0            5.0    5.0    5.0    5.0    5.0
  VMT MIX:  0.200  0.200  0.200          0.200  0.200  0.0    0.0    0.0
EXT. LOAD:  0.050  0.070  0.090
 TRLR TOW:  0.040  0.030  0.020

COMPOSITE EMISSION FACTORS (GM/MILE)
NO-MTH HC: 23.38  22.55   7.19  14.87   6.09   1.62   0.0    0.0    0.0    12.17
 *EVAP HC:  2.46   2.67   3.73   3.20   3.17   0.0    0.0    0.0    0.0     ----
EXHST  CO:284.35 265.52   4.04 134.78   2.88   3.42   0.0    0.0    0.0   112.04
EXHST NOX:  5.15   4.96   1.43   3.20   0.87   1.70   0.0    0.0    0.0     2.82

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
```

4.1.5 MOBILE2 EXAMPLE#5 Prompting, Diagnostic, and Report Output (cont.)

```
NM-ID  HC:  1.14   1.07   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
 IDLE  CO: 16.69  16.10   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
 IDLE NOX:  0.14   0.13   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
--------------------------------------------------------------------------------

ENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

 CAL. YEAR: 1985      REGION: 49-STATE LOWALT.          ALT:  500. FT.
                        TAMB: 80.0(F)        37.1/ 50.0/ 50.0
               AC (DB/WB):  0.7 ( 80.0/ 75.0)    ABSHUM: 60.00
 LDGV, LDGT1 I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN CHANGED TO 60%

VEH. TYPE:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV    MC   ALL VEH
VEH. SPD.:  5.0   15.0   25.0           35.0   45.0   55.0   50.0   20.0
  VMT MIX:  0.200  0.200  0.200         0.200  0.200  0.0    0.0    0.0
EXT. LOAD:  0.050  0.070  0.090
 TRLR TOW:  0.040  0.030  0.020

COMPOSITE EMISSION FACTORS (GM/MILE)
NO-MTH HC: 13.23   5.64   2.14   3.89   2.11   0.56   0.0    0.0    0.0     4.74
 *EVAP HC:  0.61   0.67   1.09   0.88   1.68   0.0    0.0    0.0    0.0     ----
EXHST  CO:200.59  68.77   1.33  35.05   0.57   0.68   0.0    0.0    0.0    54.39
EXHST NOX:  2.56   3.02   1.44   2.23   1.13   1.06   0.0    0.0    0.0     1.84

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-ID  HC:  0.61   0.44   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
 IDLE  CO: 10.58   7.11   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
 IDLE NOX:  0.18   0.07   0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0
--------------------------------------------------------------------------------

ENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED

 CAL. YEAR: 1985      REGION: CALIF. LOWALT.            ALT:  500. FT.
                        TAMB: 80.0(F)        37.1/ 50.0/ 50.0
               AC (DB/WB):  0.7 ( 80.0/ 75.0)    ABSHUM: 60.00
 LDGV, LDGT1 I/M PROGRAM STARTING IN 1985
 STRINGENCY LEVEL 44% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN CHANGED TO 60%

VEH. TYPE:  LDGV  LDGT1  LDGT2   LDGT   HDGV   LDDV   LDDT   HDDV    MC   ALL VEH
VEH. SPD.:  5.0   15.0   25.0           35.0   45.0   55.0   50.0   20.0
  VMT MIX:  0.200  0.200  0.200         0.200  0.200  0.0    0.0    0.0
EXT. LOAD:  0.050  0.070  0.090
 TRLR TOW:  0.040  0.030  0.020

COMPOSITE EMISSION FACTORS (GM/MILE)
```

4.1.5 MOBILE2 EXAMPLE#5 Prompting, Diagnostic, and Report Output (cont.)

```
NO-MTH HC: 10.31    4.43    3.80    4.11    3.11    0.30    0.0     0.0     0.0      4.39
 *EVAP HC:  0.56    0.62    0.49    0.55    0.35    0.0     0.0     0.0     0.0      ----
EXHST  CO:164.22   58.43   47.84   53.14  110.94    1.01    0.0     0.0     0.0     76.49
EXHST NOX:  2.12    2.49    4.13    3.31    8.47    1.14    0.0     0.0     0.0      3.67

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-ID  HC:  0.32    0.32    0.46    0.39    0.51    0.03    0.0     0.0     0.0      0.33
 IDLE  CO:  3.86    6.40    8.25    7.32    9.04    0.19    0.0     0.0     0.0      5.55
 IDLE NOX:  0.05    0.08    0.04    0.06    0.04    0.14    0.0     0.0     0.0      0.07
------------------------------------------------------------------------------------------

ENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

 CAL. YEAR: 1985       REGION: 49-STATE HIALT.           ALT: 5500. FT.
                         TAMB: 80.0(F)        37.1/ 50.0/ 50.0
                 AC (DB/WB):  0.7 ( 80.0/ 75.0)     ABSHUM: 60.00
LDGV, LDGT1 I/M PROGRAM STARTING IN 1985
STRINGENCY LEVEL 44% MECH.TRAINING: NO
I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
  I/M IDENTIFICATION RATE HAS BEEN CHANGED TO 60%

VEH. TYPE:  LDGV   LDGT1   LDGT2   LDGT    HDGV    LDDV    LDDT    HDDV    MC     ALL VEH
VEH. SPD.:  5.0    15.0    25.0            35.0    45.0    55.0    50.0    20.0
  VMT MIX:  0.200  0.200   0.200           0.200   0.200   0.0     0.0     0.0
EXT. LOAD:  0.050  0.070   0.090
 TRLR TOW:  0.040  0.030   0.020

COMPOSITE EMISSION FACTORS (GM/MILE)
NO-MTH HC: 14.53    6.50    6.74    6.62    7.20    0.45    0.0     0.0     0.0      7.08
 *EVAP HC:  0.76    0.84    1.41    1.12    2.18    0.0     0.0     0.0     0.0      ----
EXHST  CO:237.75   86.99   75.54   81.27  187.54    1.49    0.0     0.0     0.0    117.86
EXHST NOX:  2.09    2.42    3.55    2.98    8.38    1.21    0.0     0.0     0.0      3.53

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-ID  HC:  0.48    0.43    0.61    0.52    0.79    0.05    0.0     0.0     0.0      0.47
 IDLE  CO:  8.96    7.25    8.63    7.94   10.07    0.27    0.0     0.0     0.0      7.04
 IDLE NOX:  0.06    0.04    0.05    0.05    0.04    0.15    0.0     0.0     0.0      0.07
------------------------------------------------------------------------------------------

ENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

 CAL. YEAR: 2000       REGION: 49-STATE LOWALT.           ALT:  500. FT.
                         TAMB: 80.0(F)        74.2/  0.0/100.0
                 AC (DB/WB):  0.7 ( 80.0/ 75.0)     ABSHUM: 60.00
LDGV, LDGT1 I/M PROGRAM STARTING IN 1985
STRINGENCY LEVEL 44% MECH.TRAINING: NO
I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
  I/M IDENTIFICATION RATE HAS BEEN CHANGED TO 60%

VEH. TYPE:  LDGV   LDGT1   LDGT2   LDGT    HDGV    LDDV    LDDT    HDDV    MC     ALL VEH
```

4.1.5 MOBILE2 EXAMPLE#5 Prompting, Diagnostic, and Report Output (cont.)

```
VEH. SPD.:  55.0    55.0    55.0            55.0    55.0    55.0    55.0    55.0
  VMT MIX:  0.200   0.200   0.200           0.200   0.200   0.0     0.0     0.0
EXT. LOAD:  0.050   0.070   0.090
 TRLR TOW:  0.040   0.030   0.020

COMPOSITE EMISSION FACTORS (GM/MILE)
NO-MTH HC:  0.59    0.55    0.54    0.55    0.38    0.60    0.0     0.0     0.0     0.53
 *EVAP HC:  0.10    0.11    0.09    0.10    0.18    0.0     0.0     0.0     0.0     ----
EXHST  CO: 21.39   11.44    1.05    6.25    0.58    0.76    0.0     0.0     0.0     7.05
EXHST NOX:  3.89    2.56    2.14    2.35    1.31    1.36    0.0     0.0     0.0     2.25

HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-ID  HC:  0.26    0.08    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 IDLE  CO:  7.49    1.59    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
 IDLE NOX:  0.15    0.02    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0
-------------------------------------------------------------------------------------------

ENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC:
```

4.1.5 MOBILE2 EXAMPLE#5 Prompting, Diagnostic, and Report Output (cont.)

4.1.6 MOBILE2 EXAMPLE # 6

```
Input Record  (80 columns)                                                      Description                       Section

1578        IPROMT,IOUNEW(1)...IOUNEW(3)                                        FLAG                              CONTROL
MOBILE2 EXAMPLE #6                                                              TITLE                             CONTROL
1           INFLAG                                                              FLAG                              CONTROL
0           SPDFLG                                                              FLAG                              CONTROL
0           VMFLAG                                                              FLAG                              CONTROL
3           MYMRFG                                                              FLAG                              CONTROL
0           ALTFLG                                                              FLAG                              CONTROL
2           IMFLG                                                               FLAG                              CONTROL
0           ALHFLG                                                              FLAG                              CONTROL
0           TRKFLG                                                              FLAG                              CONTROL
3           IFORM                                                               FLAG                              CONTROL
2           PRTFLG                                                              FLAG                              CONTROL
0           ICEVFG                                                              FLAG                              CONTROL
0           IDLFLG                                                              FLAG                              CONTROL
0           NMHFLG                                                              FLAG                              CONTROL
0           UNFFLG                                                              FLAG                              CONTROL
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDGV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDGV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDGT1  AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDGT1  AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDGT2  AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDGT2  AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  HDGV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  HDGV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDDV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDDV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDDT   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  LDDT   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  HDDV   AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  HDDV   AGES 11-20            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  MC     AGES  1-10            ONE-TIME
 .050 .050 .050 .050 .050 .050 .050 .050 .050 .050                              MYM  MC     AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  LDV    AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  LDV    AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  LDT1   AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  LDT1   AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  LDGT2  AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  LDGT2  AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  HDGV   AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  HDGV   AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  LDV    AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  LDV    AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  LDT1   AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  LDT1   AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  HDDV   AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  HDDV   AGES 11-20            ONE-TIME
 .100 .050 .100 .050 .100 .050 .100 .050 .100 .050                              MYR  MC     AGES  1-10            ONE-TIME
 .020 .020 .020 .020 .020 .020 .020 .020 .020 .070                              MYR  MC     AGES 11-20            ONE-TIME
75 34 0 75 90 0 50 3                                                            I/M DATA                          ONE-TIME
1 70  5.0  0.0  0.0 100.  0.0                                                   SCENARIO                          PARAMETER
1 85 15.0 50.0 37.1 50.0 50.0                                                   SCENARIO                          PARAMETER
2 85 15.0 50.0 37.1 50.0 50.0                                                   SCENARIO                          PARAMETER
3 85 15.0 50.0 37.1 50.0 50.0                                                   SCENARIO                          PARAMETER
1 00 55.0 110. 74.2  0.0 100.                                                   SCENARIO                          PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 Input

Example 6 uses the "vertical" input format with prompting (IPROMT=1), and a wide (112 column) descriptive output format for 9 vehicle types, including a combined LDGT group (IFORM=3). The formatted reports are sent to unit 6 (default) since "5" is the input unit and therefore illegal for the reports. The diagnostic messages are sent to unit 7 [IOUNEW(2)=7], and prompting messages sent to unit 8 [IOUNEW(3)=8]. The output units are displayed on the unit 7 output.

The input options used in this example are:
- user supplied annual mileage accumulation rates and annual vehicle registration distribution for twenty years and eight vehicle types (MYMRFG=3)
- user supplied I/M credits for the pre-1981 model year LDGVs (see unit 4 input) and a 75 percent Technology IV identification rate (IMFLG=2).

Only CO emissions are printed for this example (PRTFLG=2).

4.1.6 MOBILE2 EXAMPLE#6 Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4

Input Record (80 columns)

```
9
SAMPLE TEXT -- (YOU
                 MAY
                  INSERT
                   ZERO
                    TO
                     NINE
                      72-CHARACTER-LINES
                       OF
                        TEXT)
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
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Description

```
THIS DATA IS INCLUDED FOR COMPLETENESS
OF THE EXAMPLE ONLY.  USERS SHOULD
CONTACT THE U.S. EPA I/M STAFF FOR
ACCURATE ESTIMATES OF ALTERNATE I/M
CREDITS FOR THEIR SITUATION.

TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
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TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
TECHNOLOGY I AND II I/M CREDITS
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

Input Record (80 columns)   Description

```
 0  8 18 20 25 24 28 26 30 28 31 29 33 31 36 34 39 38 43                 TECHNOLOGY I AND II I/M CREDITS
 3 19 17 27 22 30 24 32 26 33 27 35 29 38 32 41 36 45  0                 TECHNOLOGY I AND II I/M CREDITS
 2 20 17 28 23 31 25 33 27 34 29 37 31 40 35 43 38  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 21 18 29 23 32 26 34 28 36 30 38 33 42 37 46  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 22 18 30 24 33 27 35 29 38 32 40 35 44 39  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 22 19 30 25 34 28 37 31 40 34 43 37 46  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 23 19 31 26 35 29 38 32 41 35 44 39  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 23 20 32 26 36 30 39 34 42 37 45  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 24 20 32 27 37 31 40 35 43 38  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 24 20 33 28 38 32 41 36 45  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 24 21 34 29 39 34 43 38  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 25 21 35 30 40 35 44  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 25 22 36 31 41 37  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 25 22 37 33 42  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 26 23 38 34  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 26 23 39  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 26 24  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 26  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  8 20 21 26 25 28 26 29 27 30 28 32 30 34 33 37 36 40                 TECHNOLOGY I AND II I/M CREDITS
 3 21 18 28 23 30 24 31 25 32 27 34 28 36 31 39 34 42  0                 TECHNOLOGY I AND II I/M CREDITS
 2 22 18 29 23 31 25 32 26 33 28 35 30 38 33 41 37  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 23 19 29 23 31 25 33 27 34 29 37 32 40 35 44  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 24 20 30 24 32 26 34 28 36 31 39 34 43 38  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 24 20 30 25 33 27 35 30 38 33 41 36 45  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 2 25 21 31 25 34 28 37 31 40 35 43 38  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 25 21 32 26 35 30 38 33 42 37 46  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 26 22 32 27 36 31 40 35 44 39  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 26 22 33 28 38 32 42 37 45  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 27 23 34 29 39 34 43 38  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 27 23 35 30 41 36 45  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 27 24 36 31 42 37  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 28 24 37 33 43  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 28 25 38 34  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 28 25 39  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 29 26  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1 29  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 1  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                 TECHNOLOGY I AND II I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                                      Description

 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                      Description

 0 13 27 29 34 33 37 35 39 37 41 39 43 41 45 43 47 45 49        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0 13 28 29 34 33 37 35 39 37 41 39 43 41 45 43 47 46 49        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CPEDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0        TECHNOLOGY I AND II I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                                      Description

 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                        TECHNOLOGY I AND II I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                                          Description

 0  4 12 13 21 19 27 24 31 29 36 33 41 37 45 42 49 46 52                            TECHNOLOGY I AND II I/M CREDITS
 0 13  8 24 16 30 21 35 25 39 30 43 34 47 39 51 43 55  0                            TECHNOLOGY I AND II I/M CREDITS
 0 14  9 26 18 32 23 37 27 41 32 45 36 49 41 52 45  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 14  9 28 19 33 24 38 29 42 33 46 38 50 42 54  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 15 10 29 21 35 26 40 31 44 35 48 40 51 44  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 15 10 31 23 37 28 41 33 45 37 49 42 52  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 15 11 33 24 38 30 43 34 47 39 50 43  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 16 12 34 26 40 32 44 36 48 40 51  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 16 12 35 27 41 33 45 38 49 42  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 17 13 37 29 43 35 47 40 50  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 17 13 38 31 44 37 48 41  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 17 14 39 32 45 38 49  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 18 14 40 34 47 40  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 18 15 42 35 48  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 18 15 42 37  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 18 16 43  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 19 16  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 19  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  5 15 15 22 21 28 25 33 30 37 34 42 39 46 43 50 47 53                            TECHNOLOGY I AND II I/M CREDITS
 0 17 11 26 17 31 22 36 26 41 31 45 35 49 40 52 44 55  0                            TECHNOLOGY I AND II I/M CREDITS
 0 17 11 28 19 33 24 38 28 42 33 46 37 50 42 53 46  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 18 12 30 21 35 26 40 30 44 35 48 39 52 44 55  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 19 13 31 22 37 28 41 32 46 37 49 41 53 46  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 19 13 33 24 39 30 43 34 47 39 51 43 54  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 20 14 35 26 41 31 45 36 49 41 52 45  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 20 15 37 28 42 33 46 38 50 42 54  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 21 16 38 30 44 35 48 40 52 44  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 21 16 40 31 45 37 49 42 53  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 22 17 41 33 47 39 51 44  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 22 17 42 35 48 41 52  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 22 18 44 36 50 43  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 23 19 45 38 51  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 23 19 46 39  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 23 20 47  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 24 20  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0 24  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                            TECHNOLOGY I AND II I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                    Description

0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0                         TECHNOLOGY I AND II I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                              Description

 0  7 21 20 28 26 33 30 36 33 39 36 41 38 44 41 46 44 49               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  8 25 24 33 30 37 33 40 36 42 39 45 42 47 45 50 47 52               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0               TECHNOLOGY I AND II I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                                Description

 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY I AND II I/M CREDITS
 0   9  26  24  29  27  30  29  31  30  31  30  32  31  32  31  32  31  32            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
17  17  18  18  18  18  19  19  20  19  21  20  22  22  24  24  28   9   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0            TECHNOLOGY IV I/M CREDITS

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                                           Description

0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                              TECHNOLOGY IV I/M CREDITS
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

MOBILE2 EXAMPLE#6 I/M Credits Inputted from Unit 4 (cont.)

```
Input Record  (80 columns)                                                Description

 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0                  TECHNOLOGY IV I/M CREDITS

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.1.6 MOBILE2 EXAMPLE#6 I/M Credit Input (cont.)

```
ENTER PROJECT ID:


MOBILE2 EXAMPLE #6
ENTER INFLAG:
ENTER SPDFLG:
ENTER VMFLAG:
ENTER MYMRFG:
ENTER ALTFLG:
ENTER IMFLG:
ENTER ALHFLG:
ENTER TRKFLG:
ENTER IFORM:
ENTER PRTFLG:
ENTER ICEVFG:
ENTER IDLFLG:
ENTER NMHFLG:
ENTER UNFFLG:


ENTER MYM AGES 1-10 FOR LDGV:
ENTER MYM AGES 11-20 FOR LDGV:
ENTER MYM AGES 1-10 FOR LDGT1:
ENTER MYM AGES 11-20 FOR LDGT1:
ENTER MYM AGES 1-10 FOR LDGT2:
ENTER MYM AGES 11-20 FOR LDGT2:
ENTER MYM AGES 1-10 FOR HDGV:
ENTER MYM AGES 11-20 FOR HDGV:
ENTER MYM AGES 1-10 FOR LDDV:
ENTER MYM AGES 11-20 FOR LDDV:
ENTER MYM AGES 1-10 FOR LDDT:
ENTER MYM AGES 11-20 FOR LDDT:
ENTER MYM AGES 1-10 FOR HDDV:
ENTER MYM AGES 11-20 FOR HDDV:
ENTER MYM AGES 1-10 FOR MC:
ENTER MYM AGES 11-20 FOR MC:


ENTER MYR AGES 1-10 FOR LDGV:
ENTER MYR AGES 11-20 FOR LDGV:
ENTER MYR AGES 1-10 FOR LDGT1:
ENTER MYR AGES 11-20 FOR LDGT1:
ENTER MYR AGES 1-10 FOR LDGT2:
ENTER MYR AGES 11-20 FOR LDGT2:
ENTER MYR AGES 1-10 FOR HDGV:
ENTER MYR AGES 11-20 FOR HDGV:
ENTER MYR AGES 1-10 FOR LDDV:
ENTER MYR AGES 11-20 FOR LDDV:
ENTER MYR AGES 1-10 FOR LDDT:
ENTER MYR AGES 11-20 FOR LDDT:
ENTER MYR AGES 1-10 FOR HDDV:
ENTER MYR AGES 11-20 FOR HDDV:
ENTER MYR AGES 1-10 FOR MC:
ENTER MYR AGES 11-20 FOR MC:

ENTER YEAR I/M BEGINS, STRINGENCY, M.T. FLAG,
FIRST MODEL YEAR AND LAST MODEL YEAR OF PROG. BENEFITS
VEH.TYPE,OPTION,AND NEWDATA FLAG

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
```

4.1.6 MOBILE2 EXAMPLE#6 Prompting Output

```
ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
```

4.1.6 MOBILE2 EXAMPLE#6 Prompting Output (cont.)

```
MOBILE2 EXAMPLE #6
COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE IOUUNF=9 IOUREP=6 IOUERR=7 IOUASK=8
```

4.1.6 MOBILE2 EXAMPLE#6 Diagnostic Output

```
MOBILE2 EXAMPLE #6

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
------------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1970      REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB:  0.0(F)        0.0/100.0/  0.0
 LDGV I/M PROGRAM STARTING IN 1975
 STRINGENCY LEVEL 34% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.
 SAMPLE TEXT -- (YOU
                 MAY
                  INSERT
                   ZERO
                    TO
                     NINE
                      72-CHARACTER-LINES
                       OF
                        TEXT)

  VEH. TYPE:      LDGV     LDGT1     LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV       MC    ALL VEH.
VEH. SPEEDS:      5.0       5.0       5.0                 5.0       5.0       5.0       5.0       5.0
   VMT MIX:      0.765     0.096     0.042               0.035     0.0       0.0       0.007     0.054

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST  CO:    240.13    240.13    293.90    256.61    819.76      0.0       0.0      30.02    125.77    254.90
------------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1985      REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB: 50.0(F)       37.1/ 50.0/ 50.0
 LDGV I/M PROGRAM STARTING IN 1975
 STRINGENCY LEVEL 34% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.
 SAMPLE TEXT -- (YOU
                 MAY
                  INSERT
                   ZERO
                    TO
                     NINE
                      72-CHARACTER-LINES
                       OF
                        TEXT)

  VEH. TYPE:      LDGV     LDGT1     LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV       MC    ALL VEH.
VEH. SPEEDS:     15.0      15.0      15.0                15.0      15.0      15.0      15.0      15.0
   VMT MIX:      0.739     0.093     0.042               0.035     0.026     0.003     0.007     0.054

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST  CO:     63.86     81.39     97.58     86.47    270.87      2.54      3.88     14.94     65.16     72.08
------------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1985      REGION: CALIF. LOWALT.        ALT:  500. FT.      TAMB: 50.0(F)       37.1/ 50.0/ 50.0
 LDGV I/M PROGRAM STARTING IN 1975
 STRINGENCY LEVEL 34% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.
 SAMPLE TEXT -- (YOU
```

4.1.6 MOBILE2 EXAMPLE#6 Report Output

```
                  MAY
                   INSERT
                    ZERO
                     TO
                      NINE
                       72-CHARACTER-LINES
                        OF
                         TEXT)

  VEH. TYPE:     LDGV     LDGT1     LDGT2     LDGT     HDGV     LDDV     LDDT     HDDV     MC    ALL VEH.
VEH. SPEEDS:     15.0     15.0      15.0               15.0     15.0     15.0     15.0     15.0
    VMT MIX:     0.739    0.093     0.042              0.035    0.026    0.003    0.007    0.054

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST  CO:     52.67    66.81     84.11     72.23    252.41   2.54     2.60     14.94    63.41   61.14
------------------------------------------------------------------------------------------------------

 CAL. YEAR: 1985     REGION: 49-STATE HIALT.     ALT: 5500. FT.     TAMB: 50.0(F)     37.1/ 50.0/ 50.0
 LDGV I/M PROGRAM STARTING IN 1975
 STRINGENCY LEVEL 34% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.
 SAMPLE TEXT -- (YOU
                  MAY
                   INSERT
                    ZERO
                     TO
                      NINE
                       72-CHARACTER-LINES
                        OF
                         TEXT)

  VEH. TYPE:     LDGV     LDGT1     LDGT2     LDGT     HDGV     LDDV     LDDT     HDDV     MC    ALL VEH.
VEH. SPEEDS:     15.0     15.0      15.0               15.0     15.0     15.0     15.0     15.0
    VMT MIX:     0.739    0.093     0.042              0.035    0.026    0.003    0.007    0.054

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST  CO:     86.77    109.85    127.85    115.50   454.75   3.87     5.89     25.77    77.93   100.18
------------------------------------------------------------------------------------------------------

 CAL. YEAR: 2000     REGION: 49-STATE LOWALT.     ALT:  500. FT.     TAMB:110.0(F)     74.2/  0.0/100.0
 LDGV I/M PROGRAM STARTING IN 1975
 STRINGENCY LEVEL 34% MECH.TRAINING: NO
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1975 THROUGH 1990
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.
 SAMPLE TEXT -- (YOU
                  MAY
                   INSERT
                    ZERO
                     TO
                      NINE
                       72-CHARACTER-LINES
                        OF
                         TEXT)

  VEH. TYPE:     LDGV     LDGT1     LDGT2     LDGT     HDGV     LDDV     LDDT     HDDV     MC    ALL VEH.
VEH. SPEEDS:     55.0     55.0      55.0               55.0     55.0     55.0     55.0     55.0
    VMT MIX:     0.630    0.079     0.042              0.035    0.135    0.017    0.007    0.054
```

4.1.6 MOBILE2 EXAMPLE#6 Report Output (cont.)

```
COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST  CO:      10.06      7.54      7.54      7.54     36.51      1.08      1.71      5.65     12.33      9.42
-------------------------------------------------------------------------------------------------------------------
```

4.1.6 MOBILE2 EXAMPLE#6 Report Output (cont.)

4.1.7 MOBILE2 EXAMPLE # 7

```
Input Record  (80 columns)                                 Description                      Section

0123         IPROMT,IOUNEW(1)...IOUNEW(3)                  FLAG                             CONTROL
MOBILE2 EXAMPLE #7                                         TITLE                            CONTROL
1            INFLAG                                        FLAG                             CONTROL
0            SPDFLG                                        FLAG                             CONTROL
0            VMFLAG                                        FLAG                             CONTROL
0            MYMRFG                                        FLAG                             CONTROL
1            ALTFLG                                        FLAG                             CONTROL
0            IMFLG                                         FLAG                             CONTROL
0            ALHFLG                                        FLAG                             CONTROL
0            TRKFLG                                        FLAG                             CONTROL
3            IFORM                                         FLAG                             CONTROL
3            PRTFLG                                        FLAG                             CONTROL
2            ICEVFG                                        FLAG                             CONTROL
0            IDLFLG                                        FLAG                             CONTROL
0            NMHFLG                                        FLAG                             CONTROL
0            UNFFLG                                        FLAG                             CONTROL
10                                                         ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 5 3 51 00   3.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 6 1 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 6 2 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 6 3 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 7 1 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 7 2 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 7 3 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 8 1 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 8 2 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
1 8 3 51 00   1.00   0.00                                  ALTERNATE BASIC EMISSION RATES   ONE-TIME
  3.1  3.1  3.1 10.0  0.0  1.0  1.0  1.0                   TRIPS/DAY                        ONE-TIME
 31.1 26.3 33.7 100.  0.0  1.0  1.0  1.0                   MILES/DAY                        ONE-TIME
1 70  5.0  0.0  0.0 100.  0.0                              SCENARIO                         PARAMETER
1 85 15.0 50.0 37.1 50.0 50.0                              SCENARIO                         PARAMETER
2 85 15.0 50.0 37.1 50.0 50.0                              SCENARIO                         PARAMETER
3 85 15.0 50.0 37.1 50.0 50.0                              SCENARIO                         PARAMETER
1 00 55.0 110. 74.2  0.0 100.                              SCENARIO                         PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Example 7 uses a "vertical" input format without prompting (IPROMT=0) and a 112 column wide descriptive format for 9 vehicle types, including a combined LDGT group (IFORM=3). The formatted reports are sent to unit 1 [IOUNEW(1)=1], the diagnostic messages are sent to unit 2 [IOUNEW(2)=2], and the prompting messages, if there were any, would be sent to unit 3 [IOUNEW(3)=3]. The output units are displayed in the unit 2 output.

The input options used in this example are:

- alternative basic emission rates (ALTFLG=1)
- user supplied average trips/day and miles/day for crankcase and evaporative HC emission calculations (ICEVFG=2).

Only HC emission factors are printed (PRTFLG=1).
HC emission factors include methane (NMHFLG=0).

```
MOBILE2 EXAMPLE #7
COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE IOUUNF=9 IOUREP=1 IOUERR=2 IOUASK=3
WARNING: EQUATION  1 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=5, IP=3
WARNING: EQUATION  2 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=6, IP=1
WARNING: EQUATION  3 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=6, IP=2
WARNING: EQUATION  4 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=6, IP=3
WARNING: EQUATION  5 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=7, IP=1
WARNING: EQUATION  6 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=7, IP=2
WARNING: EQUATION  7 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=7, IP=3
WARNING: EQUATION  8 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=8, IP=1
WARNING: EQUATION  9 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=8, IP=2
WARNING: EQUATION 10 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=8, IP=3
```

4.1.7 MOBILE2 EXAMPLE#7 Diagnostic Output

```
MOBILE2 EXAMPLE #7

   EMISSION FACTOR MODIFICATION PROFILE:
REGION  VEH.  POLLUTANT  FIRST MY  LAST MY    BASE    DR   ALTERED
------  ----  ---------  --------  -------    ----   ---   -------
   1     5        3        1951     2000      3.00   0.0     YES
   1     6        1        1951     2000      1.00   0.0     YES
   1     6        2        1951     2000      1.00   0.0     YES
   1     6        3        1951     2000      1.00   0.0     YES
   1     7        1        1951     2000      1.00   0.0     YES
   1     7        2        1951     2000      1.00   0.0     YES
   1     7        3        1951     2000      1.00   0.0     YES
   1     8        1        1951     2000      1.00   0.0     YES
   1     8        2        1951     2000      1.00   0.0     YES
   1     8        3        1951     2000      1.00   0.0     YES

 *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
------------------------------------------------------------------------------------------

 CAL. YEAR: 1970      REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB:  0.0(F)        0.0/100.0/  0.0

   VEH. TYPE:       LDGV      LDGT1      LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV      MC     ALL VEH.
VEH. SPEEDS:         5.0       5.0        5.0                  5.0       5.0       5.0       5.0      5.0
   VMT MIX:         0.786     0.083      0.047                0.042     0.0       0.0       0.033    0.009

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST NOX:        8.00      8.01      12.86      9.75     11.90      0.0       0.0       1.57      2.45      8.13
------------------------------------------------------------------------------------------

 CAL. YEAR: 1985      REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB: 50.0(F)      37.1/ 50.0/ 50.0

   VEH. TYPE:       LDGV      LDGT1      LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV      MC     ALL VEH.
VEH. SPEEDS:        15.0      15.0       15.0                 15.0      15.0      15.0      15.0      15.0
   VMT MIX:         0.750     0.079      0.046                0.042     0.036     0.005     0.033    0.009

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST NOX:        2.21      2.72       2.42      2.61     10.48      3.73      1.24      1.12      1.08      2.61
------------------------------------------------------------------------------------------

 CAL. YEAR: 1985      REGION: CALIF. LOWALT.        ALT:  500. FT.      TAMB: 50.0(F)      37.1/ 50.0/ 50.0

   VEH. TYPE:       LDGV      LDGT1      LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV      MC     ALL VEH.
VEH. SPEEDS:        15.0      15.0       15.0                 15.0      15.0      15.0      15.0      15.0
   VMT MIX:         0.750     0.079      0.046                0.042     0.036     0.005     0.033    0.009

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST NOX:        1.83      2.17       1.89      2.07      6.87      1.31      1.76     19.99      0.85      2.64
------------------------------------------------------------------------------------------

 CAL. YEAR: 1985      REGION: 49-STATE HIALT.       ALT: 5500. FT.      TAMB: 50.0(F)      37.1/ 50.0/ 50.0

   VEH. TYPE:       LDGV      LDGT1      LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV      MC     ALL VEH.
VEH. SPEEDS:        15.0      15.0       15.0                 15.0      15.0      15.0      15.0      15.0
   VMT MIX:         0.750     0.079      0.046                0.042     0.036     0.005     0.033    0.009

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST NOX:        1.76      2.19       2.09      2.15      8.05      1.42      2.45     28.74      0.54      2.94
------------------------------------------------------------------------------------------

 CAL. YEAR: 2000      REGION: 49-STATE LOWALT.      ALT:  500. FT.      TAMB:110.0(F)      74.2/  0.0/100.0
```

4.1.7 MOBILE2 EXAMPLE#7 Report Output

```
  VEH. TYPE:      LDGV     LDGT1     LDGT2      LDGT      HDGV      LDDV      LDDT      HDDV      MC    ALL VEH.
VEH. SPEEDS:     55.0      55.0      55.0                 55.0      55.0      55.0      55.0      55.0
    VMT MIX:      0.631     0.067     0.046                0.042     0.153     0.018     0.033     0.009

COMPOSITE EMISSION FACTORS (GM/MILE)
EXHAUST NOX:      1.36      0.93      0.79      0.87      2.66      4.08      1.36      1.20      1.51      1.77
----------------------------------------------------------------------------------------------------------------
```

4.1.7 MOBILE2 EXAMPLE#7 Report Output (cont.)

4.1.8 MOBILE2 EXAMPLE # 8

```
Input Record  (80 columns)                                              Description                         Section

1677         IPROMT,IOUNEW(1)...IOUNEW(3)                               FLAG                                CONTROL
MOBILE2 EXAMPLE #8                                                      TITLE                               CONTROL
1            INFLAG                                                     FLAG                                CONTROL
0            SPDFLG                                                     FLAG                                CONTROL
0            VMFLAG                                                     FLAG                                CONTROL
0            MYMRFG                                                     FLAG                                CONTROL
0            ALTFLG                                                     FLAG                                CONTROL
0            IMFLG                                                      FLAG                                CONTROL
2            ALHFLG                                                     FLAG                                CONTROL
0            TRKFLG                                                     FLAG                                CONTROL
1            IFORM                                                      FLAG                                CONTROL
1            PRTFLG                                                     FLAG                                CONTROL
0            ICEVFG                                                     FLAG                                CONTROL
1            IDLFLG                                                     FLAG                                CONTROL
1            NMHFLG                                                     FLAG                                CONTROL
0            UNFFLG                                                     FLAG                                CONTROL
1 75  5.0 80.0  0.0 100.  0.0                                           SCENARIO                            PARAMETER
.100.050.070.090.040.030.02060.080.075.0                                LD ADDITIONAL CORRECTION FACTORS    PARAMETER
1 80 19.6 80.0 20.6 27.3 20.6                                           SCENARIO                            PARAMETER
.100.050.070.090.040.030.02060.080.075.0                                LD ADDITIONAL CORRECTION FACTORS    PARAMETER
1 85 15.0 80.0 50.0 50.0 50.0                                           SCENARIO                            PARAMETER
.100.050.070.090.040.030.02060.080.075.0                                LD ADDITIONAL CORRECTION FACTORS    PARAMETER
1 90 35.0 80.0 80.0 20.0 80.0                                           SCENARIO                            PARAMETER
.100.050.070.090.040.030.02060.080.075.0                                LD ADDITIONAL CORRECTION FACTORS    PARAMETER
1 95 45.0 80.0 90.0 10.0 90.0                                           SCENARIO                            PARAMETER
.100.050.070.090.040.030.02060.080.075.0                                LD ADDITIONAL CORRECTION FACTORS    PARAMETER
1 00 55.0 80.0 100.  0.0 100.                                           SCENARIO                            PARAMETER
.100.050.070.090.040.030.02060.080.075.0                                LD ADDITIONAL CORRECTION FACTORS    PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Example 8 uses a "vertical" input format with prompting (IPROMT=1) and a descriptive format for 6 vehicle types (LDDs are excluded, IFORM=1). The formatted reports are sent to unit 6 [IOUNEW(1)=6], the diagnostic and prompting messages are sent to unit 7 [IOUNEW(2)=IOUNEW(3)=7]. The output units are displayed on the unit 7 output.

Four additional light-duty correction factors are used as an input option (ALHFLG=2).

The output options used are:
- print only HC emissions (PRTFLG=1)
- print idle emissions (IDLFLG=1)
- print non-methane HC emissions (NMHFLG=1).

```
ENTER PROJECT ID:


MOBILE2 EXAMPLE #8
COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE IOUUNF=9 IOUREP=6 IOUERR=7 IOUASK=7
ENTER INFLAG:
ENTER SPDFLG:
ENTER VMFLAG:
ENTER MYMRFG:
ENTER ALTFLG:
ENTER IMFLG:
ENTER ALHFLG:
ENTER TRKFLG:
ENTER IFORM:
ENTER PRTFLG:
ENTER ICEVFG:
ENTER IDLFLG:
ENTER NMHFLG:
ENTER UNFFLG:

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
```

4.1.8 MOBILE2 EXAMPLE#8 Prompting and Diagnostic Output

```
MOBILE2 EXAMPLE #.

  *NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1975     TEMP: 80.0(F)         0.786/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE     5.0/ 5.0/ 5.0 MPH ( 5.0)  0.0/100.0/  0.0

  AC:  0.70  XLOAD:   0.05   0.07   0.09  TRAILR:   0.04  ABSHUM:  60.00

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
NON-METH HC:       22.20     21.52     29.82     51.08      8.15     31.51     23.33

                    HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:        1.09      1.02      1.17      1.46      0.35      2.07      1.08
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1980     TEMP: 80.0(F)         0.781/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    19.6/19.6/19.6 MPH (19.6) 20.6/ 27.3/ 20.6

  AC:  0.70  XLOAD:   0.05   0.07   0.09  TRAILR:   0.04  ABSHUM:  60.00

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
NON-METH HC:        4.83      4.95      5.82     15.86      4.28      7.92      5.33

                    HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:        0.78      0.69      0.70      1.02      0.35      1.38      0.76
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 80.0(F)         0.750/0.079/0.046/0.042/0.033/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 50.0/ 50.0/ 50.0

  AC:  0.70  XLOAD:   0.05   0.07   0.09  TRAILR:   0.04  ABSHUM:  60.00

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
NON-METH HC:        4.53      5.08      3.80     12.52      5.13      8.12      4.78

                    HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:        0.52      0.38      0.21      0.58      0.35      0.78      0.48
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1990     TEMP: 80.0(F)         0.693/0.073/0.046/0.042/0.033/0.009
 REGION: 49-STATE    35.0/35.0/35.0 MPH (35.0) 80.0/ 20.0/ 80.0

  AC:  0.70  XLOAD:   0.05   0.07   0.09  TRAILR:   0.04  ABSHUM:  60.00

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
NON-METH HC:        1.39      1.70      1.03      2.61      2.30      5.74      1.42

                    HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:        0.34      0.19      0.09      0.30      0.29      0.76      0.28
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1995     TEMP: 80.0(F)         0.647/0.069/0.046/0.042/0.033/0.009
 REGION: 49-STATE    45.0/45.0/45.0 MPH (45.0) 90.0/ 10.0/ 90.0
```

4.1.9 MOBILE2 EXAMPLE#9 Report Output

```
 AC:  0.70  XLOAD:   0.05   0.07   0.09  TRAILR:   0.04  ABSHUM:  60.00

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
NON-METH HC:     0.78     0.69      0.61      1.27      1.79      5.37     0.82

                 HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:     0.25     0.10      0.06      0.22      0.27      0.76     0.21
----------------------------------------------------------------------------------
                                     VEH  TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
CAL. YEAR: 2000     TEMP: 60.0(F)          0.631/0.087/0.046/0.042/0.033/0.009
REGION: 49-STATE    55.0/55.0/55.0 MPH (55.0)100.0/  0.0/100.0

 AI:  0.70  XLOAD:   0.05   0.07   0.09  TRAILR:   0.04  ABSHUM:  60.00

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
NON-METH HC:     0.62     0.56      0.49      0.89      1.58      5.26     0.66

                 HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:     0.24     0.07      0.05      0.20      0.26      0.76     0.18
----------------------------------------------------------------------------------
```

4.2 MOBILE1 EXAMPLES THROUGH MOBILE2

To illustrate that MOBILE2 input streams and output reports are similar to those of MOBILE1, the thirteen MOBILE1 examples (from the MOBILE1 User's Guide) were run through MOBILE2. These examples are provided on the following pages.

Each example contains an image of the input stream, a description of any changes needed to allow the input to run through MOBILE2, and the generated output. The input streams as displayed have had the necessary changes made. The user is referred to the MOBILE1 User's Guide for an image of the input streams in their original MOBILE1 format.

A MOBILE1 input data set will have to be modified before being fed into MOBILE2 if any of the following options are used:

1. The list-directed (free format) option (INFLAG=0) as in Example 1 of the MOBILE1 User's Guide.

2. The three speed input option (SP3FLG=1) as in Examples 3 and 13 of the MOBILE1 User's Guide.

3. The user supplied VMT option (VMFLAG=1 or 2) where LDDV and LDDT VMT fractions must be included (as in Examples 4, 5, and 13 of the MOBILE1 User's Guide).

4. The user supplied annual mileage accumulation rate option (MYMRFG=1 or 3) where LDDV and LDDT annual mileage accumulation rates must be included (as in Examples 6, 8, and 13 of the MOBILE1 User's Guide).

5. The user supplied July 1 registration mix option (MYMRFG=2 or 3) where again LDDV and LDDT information must be included (as in Examples 7, 8, and 13 of the MOBILE1 User's Guide).

4.2.1 MOBILE1 EXAMPLE # 1

Input Record (80 columns)	Description	Section
0 IPROMT	FLAG	CONTROL
EXAMPLE 1: LIST-DIRECTED INPUT	TITLE	CONTROL
1 INFLAG	FLAG	CONTROL
0 SPDFLG	FLAG	CONTROL
0 VMFLAG	FLAG	CONTROL
0 MYMRFG	FLAG	CONTROL
0 ALTFLG	FLAG	CONTROL
0 IMFLG	FLAG	CONTROL
0 ALHFLG	FLAG	CONTROL
0 TRKFLG	FLAG	CONTROL
0 IFORM	FLAG	CONTROL
0 PRTFLG	FLAG	CONTROL
0 ICEVFG	FLAG	CONTROL
0 IDLFLG	FLAG	CONTROL
0 NMHFLG	FLAG	CONTROL
0 UNFFLG	FLAG	CONTROL
1 70 19.6 75.0 20.6 27.3 20.6	SCENARIO	PARAMETER

```
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 does not have the list-directed input option. Therefore, this example did not run. However, MOBILE2 can be easily modified to accept the list-directed input option. To run this example on MOBILE2 the scenario record was changed to correspond to the formatted input format (I1,1X,I2,5(1X,F4.1)), and the INFLAG flag was changed to 1.

```
EXAMPLE 1: LIST-DIRECTED INPUT
                                                        P                                                                                                 C.E.F.
R                                                       O              COMPOSITE EMISSION FACTORS                                  VEHICLE MIX            ALL VEH
E         SPEEDS        AMB.                            L     LDV    LDT1    LDT2     HDG     HDD      MC     LDV  LDT1  LDT2   HDG   HDD    MC     ------
G CY  LD    HD    MC    TMP    COLD/HOT START           -  -----------------------------------------------  -------------------------------------    14.89
- --  --------------    ---   ---------------------    1   11.30   11.24   13.88   28.05    4.45   11.23 0.786 0.083 0.047 0.042 0.033 0.009    91.19
1 70 19.6/19.6/19.6    75   20.6   27.3   20.6         2   86.14   82.61   96.65  270.08   13.43   35.79 0.786 0.083 0.047 0.042 0.033 0.009     4.70
1 70 19.6/19.6/19.6    75   20.6   27.3   20.6         3    3.69    3.75    5.56    8.85   25.80    0.24 0.786 0.083 0.047 0.042 0.033 0.009
1 70 19.6/19.6/19.6    75   20.6   27.3   20.6
```

4.2.1 MOBILE1 EXAMPLE#1 Output

4.2.2 MOBILE1 EXAMPLE # 2

Input Record (80 columns)	Description	Section
0 IPROMT	FLAG	CONTROL
EXAMPLE 2: FORMATTED INPUT	TITLE	CONTROL
1 INFLAG	FLAG	CONTROL
0 SPDFLG	FLAG	CONTROL
0 VMFLAG	FLAG	CONTROL
0 MYMRFG	FLAG	CONTROL
0 ALTFLG	FLAG	CONTROL
0 IMFLG	FLAG	CONTROL
0 ALHFLG	FLAG	CONTROL
0 TRKFLG	FLAG	CONTROL
1 IFORM	FLAG	CONTROL
0 PRTFLG	FLAG	CONTROL
0 ICEVFG	FLAG	CONTROL
0 IDLFLG	FLAG	CONTROL
0 NMHFLG	FLAG	CONTROL
0 UNFFLG	FLAG	CONTROL
1 70 19.6 75.0 20.6 27.3 20.6	SCENARIO	PARAMETER

```
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 ran this example without any modification.

```
EXAMPLE 2: FORMATTED INPUT

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
---------------------------------------------------------------------------------
                                VEH. TYPE:  LDV    LDT1  LDT2  HDG    HDD    MC
 CAL. YEAR: 1970     TEMP: 75.0(F)          0.786/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    19.6/19.6/19.6 MPH (19.6) 20.6/ 27.3/ 20.6

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV       LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:    11.30     11.24     13.88     28.05      4.45     11.23     11.89
EXHAUST  CO:    86.14     82.61     96.65    270.08     13.43     35.79     91.19
EXHAUST NOX:     3.69      3.75      5.56      8.85     25.80      0.24      4.70
---------------------------------------------------------------------------------
```

4.2.2 MOBILE1 EXAMPLE#2 Output

4.2.3 MOBILE1 EXAMPLE # 3

```
Input Record  (80 columns)                                                          Description                   Section

O        IPROMT                                                                     FLAG                          CONTROL
EXAMPLE 3: 3-SPEED INPUT                                                            TITLE                         CONTROL
1        INFLAG                                                                     FLAG                          CONTROL
O        SPDFLG                                                                     FLAG                          CONTROL
O        VMFLAG                                                                     FLAG                          CONTROL
O        MYMRFG                                                                     FLAG                          CONTROL
O        ALTFLG                                                                     FLAG                          CONTROL
O        IMFLG                                                                      FLAG                          CONTROL
O        ALHFLG                                                                     FLAG                          CONTROL
O        TRKFLG                                                                     FLAG                          CONTROL
1        IFORM                                                                      FLAG                          CONTROL
O        PRTFLG                                                                     FLAG                          CONTROL
O        ICEVFG                                                                     FLAG                          CONTROL
O        IDLFLG                                                                     FLAG                          CONTROL
O        NMHFLG                                                                     FLAG                          CONTROL
O        UNFFLG                                                                     FLAG                          CONTROL
1 81 16.0 75.0 20.6 27.3 20.6                                                       SCENARIO                      PARAMETER
1 82 16.0 75.0 20.6 27.3 20.6                                                       SCENARIO                      PARAMETER
1 83 16.0 75.0 20.6 27.3 20.6                                                       SCENARIO                      PARAMETER
1 84 16.0 75.0 20.6 27.3 20.6                                                       SCENARIO                      PARAMETER
1 85 16.0 75.0 20.6 27.3 20.6                                                       SCENARIO                      PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 does not have the three-speed input option. Therefore, this example did not run. MOBILE2 no longer operates with bag speed correction factors. Instead, either one average speed for all vehicles or eight average speeds (one for each vehicle type) must be supplied on the scenario record. However, MOBILE2 was originally set up for a three-speed input option and can easily be converted for this option. A word of caution must be given to users who implement the three speed option. The speeds are not bag speeds as defined in MOBILE1. The three speeds correspond to (1) the LDVs and LDTs (both diesel-powered and gasoline powered), (2) the HDVs, and (3) MCs.

To run this example, SPDFLG was set to zero, and the bag 1 and bag 3 speeds (26.0 mph) were removed.

4.2.3 MOBILE1 EXAMPLE#3 Input

```
EXAMPLE 3: 3-SPEED INPUT

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1981     TEMP: 75.0(F)         0.777/0.082/0.046/0.042/0.033/0.009
 REGION: 49-STATE    16.0/16.0/16.0 MPH (16.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1     LDT2     HDG      HDD       MC    ALL MODES
   TOTAL HC:    5.17     5.41     5.31    18.72     5.13     8.36     5.75
 EXHAUST  CO:  51.72    51.06    46.35   288.66    16.41    31.68    59.53
 EXHAUST NOX:   2.51     2.77     2.96     9.65    28.00     0.58     3.67
------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1982     TEMP: 75.0(F)         0.773/0.082/0.046/0.042/0.033/0.009
 REGION: 49-STATE    16.0/16.0/16.0 MPH (16.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1     LDT2     HDG      HDD       MC    ALL MODES
   TOTAL HC:    4.68     4.97     4.33    17.45     5.13     7.60     5.20
 EXHAUST  CO:  47.40    47.85    39.25   281.28    16.41    28.88    55.01
 EXHAUST NOX:   2.29     2.68     2.66     9.67    28.00     0.67     3.47
------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983     TEMP: 75.0(F)         0.766/0.081/0.046/0.042/0.033/0.009
 REGION: 49-STATE    16.0/16.0/16.0 MPH (16.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1     LDT2     HDG      HDD       MC    ALL MODES
   TOTAL HC:    4.28     4.59     3.78    16.13     5.13     7.09     4.75
 EXHAUST  CO:  44.00    44.81    35.09   273.03    16.41    26.99    51.24
 EXHAUST NOX:   2.12     2.59     2.51     9.67    28.00     0.72     3.32
------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1984     TEMP: 75.0(F)         0.758/0.080/0.046/0.042/0.033/0.009
 REGION: 49-STATE    16.0/16.0/16.0 MPH (16.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1     LDT2     HDG      HDD       MC    ALL MODES
   TOTAL HC:    3.91     4.23     3.27    14.89     5.13     6.85     4.33
 EXHAUST  CO:  40.60    41.58    30.76   264.91    16.41    25.71    47.49
 EXHAUST NOX:   2.00     2.48     2.32     9.68    28.00     0.76     3.21
------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 75.0(F)         0.750/0.079/0.046/0.042/0.033/0.009
 REGION: 49-STATE    16.0/16.0/16.0 MPH (16.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1     LDT2     HDG      HDD       MC    ALL MODES
   TOTAL HC:    3.56     3.87     2.78    12.57     5.13     6.72     3.89
 EXHAUST  CO:  37.43    37.75    25.80   225.18    16.41    24.86    42.56
 EXHAUST NOX:   1.89     2.31     2.01    10.17    28.00     0.78     3.10
------------------------------------------------------------------------------
```

4.2.3 MOBILE1 EXAMPLE#3 Output

4.2.4 MOBILE1 EXAMPLE # 4

```
Input Record  (80 columns)                                                  Description         Section

0        IPROMT                                                             FLAG                CONTROL
EXAMPLE 4: USER-SUPPLIED VMT MIX                                            TITLE               CONTROL
1        INFLAG                                                             FLAG                CONTROL
0        SPDFLG                                                             FLAG                CONTROL
1        VMFLAG                                                             FLAG                CONTROL
0        MYMRFG                                                             FLAG                CONTROL
0        ALTFLG                                                             FLAG                CONTROL
0        IMFLG                                                              FLAG                CONTROL
0        ALHFLG                                                             FLAG                CONTROL
0        TRKFLG                                                             FLAG                CONTROL
1        IFORM                                                              FLAG                CONTROL
0        PRTFLG                                                             FLAG                CONTROL
0        ICEVFG                                                             FLAG                CONTROL
0        IDLFLG                                                             FLAG                CONTROL
0        NMHFLG                                                             FLAG                CONTROL
0        UNFFLG                                                             FLAG                CONTROL
1 70 19.6 75.0 20.6 27.3 20.6                                               SCENARIO            PARAMETER
.760.030.040.080.000.000.080.010                                            VMT MIX             PARAMETER
1 79 19.6 75.0 20.6 27.3 20.6                                               SCENARIO            PARAMETER
.740.035.045.085.000.000.085.010                                            VMT MIX             PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 did not run this example. MOBILE2 incorporates two new vehicle types into the emission factor calculations: LDDVs and LDDTs. As a result, vehicle miles travelled (VMT) fractions for the two new vehicle types had to be included to make this example run successfully. Further, VMT fractions of zero must be entered prior to 1975 for LDDVs and prior to 1978 for LDDTs. Sales prior to those years were considered insignificant. If the VMT fractions prior to those years are not zero, an error will result and MOBILE2 will terminate. The VMT mix fractions must be entered in the following order for the vehicle types: LDGV, LDGT1, LDGT2, HDGV, LDDV, LDDT, HDDV, and MC.

```
EXAMPLE 4: USER-SUPPLIED VMT MIX

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1970     TEMP: 75.0(F)        0.760/0.030/0.040/0.080/0.080/0.010
 REGION: 49-STATE    19.6/19.6/19.6 MPH (19.6) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:    11.30     11.24     13.88     28.05      4.45    11.23     12.19
EXHAUST  CO:    86.14     82.61     96.65    270.08     13.43    35.79     94.85
EXHAUST NOX:     3.69      3.75      5.56      8.85     25.80     0.24      5.91
------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1979     TEMP: 75.0(F)        0.740/0.035/0.045/0.085/0.085/0.010
 REGION: 49-STATE    19.6/19.6/19.6 MPH (19.6) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:     5.55      5.75      8.21     18.50      4.45     9.44      6.73
EXHAUST  CO:    51.84     50.94     61.34    251.70     13.43    31.91     65.76
EXHAUST NOX:     3.01      3.29      4.56      9.98     25.80     0.39      5.60
------------------------------------------------------------------------
```

4.2.4 MOBILE1 EXAMPLE#4 Output

4.2.5 MOBILE1 EXAMPLE # 5

```
Input Record  (80 columns)                                                      Description        Section

O        IPROMT                                                                 FLAG               CONTROL
EXAMPLE 5: USER-SUPPLIED ONE-TIME VMT MIX                                       TITLE              CONTROL
1        INFLAG                                                                 FLAG               CONTROL
O        SPDFLG                                                                 FLAG               CONTROL
2        VMFLAG                                                                 FLAG               CONTROL
O        MYMRFG                                                                 FLAG               CONTROL
O        ALTFLG                                                                 FLAG               CONTROL
O        IMFLG                                                                  FLAG               CONTROL
O        ALHFLG                                                                 FLAG               CONTROL
O        TRKFLG                                                                 FLAG               CONTROL
1        IFORM                                                                  FLAG               CONTROL
O        PRTFLG                                                                 FLAG               CONTROL
O        ICEVFG                                                                 FLAG               CONTROL
O        IDLFLG                                                                 FLAG               CONTROL
O        NMHFLG                                                                 FLAG               CONTROL
O        UNFFLG                                                                 FLAG               CONTROL
.803.058.058.045.000.000.031.005                                                VMT MIX            ONE-TIME DATA
1 70 19.6 75.0 20.6 27.3 20.6                                                   SCENARIO           PARAMETER
1 79 19.6 75.0 20.6 27.3 20.6                                                   SCENARIO           PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 did not run this example successfully. LDD data had to be added to the VMT mix record. See the MOBILE1 Example # 4 comments.

```
EXAMPLE 5: USER-SUPPLIED ONE-TIME VMT MIX

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
----------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1970      TEMP: 75.0(F)         0.803/0.058/0.058/0.045/0.031/0.005
 REGION: 49-STATE     19.6/19.6/19.6 MPH (19.6) 20.6/ 27.3/ 20.6

                        COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV        LDT1       LDT2       HDG        HDD        MC      ALL MODES
   TOTAL HC:       11.30      11.24      13.88      28.05       4.45      11.23      11.99
EXHAUST  CO:       86.14      82.61      96.65     270.08      13.43      35.79      92.31
EXHAUST NOX:        3.69       3.75       5.56       8.85      25.80       0.24       4.70
----------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1979      TEMP: 75.0(F)         0.803/0.058/0.058/0.045/0.031/0.005
 REGION: 49-STATE     19.6/19.6/19.6 MPH (19.6) 20.6/ 27.3/ 20.6

                        COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV        LDT1       LDT2       HDG        HDD        MC      ALL MODES
   TOTAL HC:        5.55       5.75       8.21      18.50       4.45       9.44       6.29
EXHAUST  CO:       51.84      50.94      61.34     251.70      13.43      31.91      60.05
EXHAUST NOX:        3.01       3.29       4.56       9.98      25.80       0.39       4.13
----------------------------------------------------------------------------------
```

4.2.5 MOBILE1 EXAMPLE#5 Output

4.2.6 MOBILE1 EXAMPLE # 6

```
Input Record  (80 columns)                                                            Description              Section

0         IPROMT                                                                      FLAG                     CONTROL
EXAMPLE 6: USER-SUPPLIED MILEAGE ACCRUAL DATA                                         TITLE                    CONTROL
1         INFLAG                                                                      FLAG                     CONTROL
0         SPDFLG                                                                      FLAG                     CONTROL
0         VMFLAG                                                                      FLAG                     CONTROL
1         MYMRFG                                                                      FLAG                     CONTROL
0         ALTFLG                                                                      FLAG                     CONTROL
0         IMFLG                                                                       FLAG                     CONTROL
0         ALHFLG                                                                      FLAG                     CONTROL
0         TRKFLG                                                                      FLAG                     CONTROL
1         IFORM                                                                       FLAG                     CONTROL
0         PRTFLG                                                                      FLAG                     CONTROL
0         ICEVFG                                                                      FLAG                     CONTROL
0         IDLFLG                                                                      FLAG                     CONTROL
0         NMHFLG                                                                      FLAG                     CONTROL
0         UNFFLG                                                                      FLAG                     CONTROL
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                                    MYM  LDGV  AGES  1-10    ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                                    MYM  LDGV  AGES 11-20    ONE-TIME DATA
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                                    MYM  LDGT1 AGES  1-10    ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                                    MYM  LDGT1 AGES 11-20    ONE-TIME DATA
 .157 .157 .141 .126 .113 .102 .094 .086 .080 .075                                    MYM  LDGT2 AGES  1-10    ONE-TIME DATA
 .071 .066 .063 .060 .055 .052 .050 .047 .044 .041                                    MYM  LDGT2 AGES 11-20    ONE-TIME DATA
 .190 .190 .179 .165 .150 .135 .120 .106 .095 .086                                    MYM  HDGV  AGES  1-10    ONE-TIME DATA
 .078 .070 .063 .059 .053 .049 .047 .046 .044 .042                                    MYM  HDGV  AGES 11-20    ONE-TIME DATA
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                                    MYM  LDDV  AGES  1-10    ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                                    MYM  LDDV  AGES 11-20    ONE-TIME DATA
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                                    MYM  LDDT  AGES  1-10    ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                                    MYM  LDDT  AGES 11-20    ONE-TIME DATA
 .736 .736 .699 .633 .566 .500 .456 .412 .382 .360                                    MYM  HDDV  AGES  1-10    ONE-TIME DATA
 .346 .338 .331 .324 .309 .287 .257 .213 .184 .154                                    MYM  HDDV  AGES 11-20    ONE-TIME DATA
.0201.0251.0207.0185.0172.0162.0155.0149.0143.0139                                    MYM  MC    AGES  1-10    ONE-TIME DATA
.0135.0132.0129.0127.0125.0123.0122.0121.0120.0119                                    MYM  MC    AGES 11-20    ONE-TIME DATA
1 83  5.0 75.0 20.6 27.3 20.6                                                         SCENARIO                 PARAMETER
1 83 10.0 75.0 20.6 27.3 20.6                                                         SCENARIO                 PARAMETER
1 83 15.0 75.0 20.6 27.3 20.6                                                         SCENARIO                 PARAMETER
1 83 20.0 75.0 20.6 27.3 20.6                                                         SCENARIO                 PARAMETER
1 83 25.0 75.0 20.6 27.3 20.6                                                         SCENARIO                 PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 did not run this example because annual mileage accumulation rates were missing for the LDDV and LDDT vehicle types.
This example was run by supplying annual mileage accumulation rate distributions for the two LDD vehicle types.

```
WARNING:  0.132E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.129E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.127E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.125E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.123E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.122E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.121E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.120E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.119E-01 MILEAGE WITH ZERO REGISTRATION

EXAMPLE 6: USER-SUPPLIED MILEAGE ACCRUAL DATA

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-----------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983     TEMP: 75.0(F)          0.746/0.091/0.050/0.043/0.037/0.009
 REGION: 49-STATE     5.0/ 5.0/ 5.0 MPH ( 5.0) 20.6/ 27.3/ 20.6

                      COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:     10.25     12.13     10.46     34.18      8.71     18.72     11.25
 EXHAUST  CO:   120.13    136.83    110.95    625.55     35.77     99.82    136.56
 EXHAUST NOX:     1.86      2.40      2.27      8.71     40.83      0.69      3.66
-----------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983     TEMP: 75.0(F)          0.746/0.091/0.050/0.043/0.037/0.009
 REGION: 49-STATE    10.0/10.0/10.0 MPH (10.0) 20.6/ 27.3/ 20.6

                      COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:      5.67      6.75      5.62     23.55      6.84     10.95      6.50
 EXHAUST  CO:    60.89     69.38     54.79    416.19     24.66     48.73     73.61
 EXHAUST NOX:     1.85      2.38      2.30      9.15     33.87      0.62      3.41
-----------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983     TEMP: 75.0(F)          0.746/0.091/0.050/0.043/0.037/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                      COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:      4.18      5.00      4.05     17.14      5.49      8.33      4.80
 EXHAUST  CO:    43.29     49.16     37.95    292.55     17.80     32.02     52.12
 EXHAUST NOX:     2.00      2.56      2.48      9.60     29.12      0.63      3.38
-----------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983     TEMP: 75.0(F)          0.746/0.091/0.050/0.043/0.037/0.009
 REGION: 49-STATE    20.0/20.0/20.0 MPH (20.0) 20.6/ 27.3/ 20.6

                      COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV       LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:      3.45      4.14      3.30     13.17      4.50      7.13      3.92
 EXHAUST  CO:    34.94     39.59     30.09    217.27     13.44     24.45     41.17
 EXHAUST NOX:     2.21      2.84      2.73     10.04     25.94      0.68      3.48
-----------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983     TEMP: 75.0(F)          0.746/0.091/0.050/0.043/0.037/0.009
 REGION: 49-STATE    25.0/25.0/25.0 MPH (25.0) 20.6/ 27.3/ 20.6

                      COMPOSITE EMISSION FACTORS (GM/MILE)
```

4.2.6 MOBILE1 EXAMPLE#6 Output

```
                 LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:     2.94     3.54      2.79     10.63      3.78     6.40      3.32
EXHAUST  CO:    28.78    32.65     24.58    170.48     10.62    19.93     33.53
EXHAUST NOX:     2.44     3.12      2.99     10.48     23.94     0.75      3.62
---------------------------------------------------------------------------------
```

4.2.6 MOBILE4 EXAMPLE#6 Output (cont.)

4.2.7 MOBILE1 EXAMPLE # 7

```
Input Record  (80 columns)                                    Description                  Section

0         IPROMT                                              FLAG                         CONTROL
EXAMPLE 7: USER-SUPPLIED VEHICLE REGISTRATION DATA            TITLE                        CONTROL
1         INFLAG                                              FLAG                         CONTROL
0         SPDFLG                                              FLAG                         CONTROL
0         VMFLAG                                              FLAG                         CONTROL
2         MYMRFG                                              FLAG                         CONTROL
0         ALTFLG                                              FLAG                         CONTROL
0         IMFLG                                               FLAG                         CONTROL
0         ALHFLG                                              FLAG                         CONTROL
0         TRKFLG                                              FLAG                         CONTROL
1         IFORM                                               FLAG                         CONTROL
0         PRTFLG                                              FLAG                         CONTROL
0         ICEVFG                                              FLAG                         CONTROL
0         IDLFLG                                              FLAG                         CONTROL
0         NMHFLG                                              FLAG                         CONTROL
0         UNFFLG                                              FLAG                         CONTROL
 .075 .107 .107 .106 .100 .092 .085 .077 .066 .052            MYR  LDV ,AGES  1-10         ONE-TIME DATA
 .039 .027 .018 .014 .009 .006 .005 .005 .005 .004            MYR  LDV ,AGES 11-20         ONE-TIME DATA
 .061 .095 .094 .103 .083 .076 .076 .063 .054 .043            MYR  LDT1,AGES  1-10         ONE-TIME DATA
 .036 .024 .030 .028 .026 .024 .022 .020 .018 .016            MYR  LDT1,AGES 11-20         ONE-TIME DATA
 .037 .070 .078 .086 .075 .075 .075 .068 .059 .053            MYR  LDT2,AGES  1-10         ONE-TIME DATA
 .044 .032 .038 .036 .034 .032 .030 .028 .026 .024            MYR  LDT2,AGES 11-20         ONE-TIME DATA
 .037 .070 .078 .086 .075 .075 .075 .068 .059 .053            MYR  HDG ,AGES  1-10         ONE-TIME DATA
 .044 .032 .038 .036 .034 .032 .030 .028 .026 .024            MYR  HDG ,AGES 11-20         ONE-TIME DATA
 .075 .107 .107 .106 .100 .092 .085 .077 .066 .052            MYR  LDV ,AGES  1-10         ONE-TIME DATA
 .039 .027 .018 .014 .009 .006 .005 .005 .005 .004            MYR  LDV ,AGES 11-20         ONE-TIME DATA
 .061 .095 .094 .103 .083 .076 .076 .063 .054 .043            MYR  LDT1,AGES  1-10         ONE-TIME DATA
 .036 .024 .030 .028 .026 .024 .022 .020 .018 .016            MYR  LDT1,AGES 11-20         ONE-TIME DATA
 .077 .135 .134 .131 .099 .090 .082 .062 .045 .033            MYR  HDD ,AGES  1-10         ONE-TIME DATA
 .025 .015 .013 .011 .010 .008 .007 .006 .005 .004            MYR  HDD ,AGES 11-20         ONE-TIME DATA
 .105 .225 .206 .149 .097 .062 .046 .033 .029 .023            MYR  MC  ,AGES  1-10         ONE-TIME DATA
 .008 .005 .013 .0   .0   .0   .0   .0   .0   .0              MYR  MC  ,AGES 11-20         ONE-TIME DATA
1 83  5.0 75.0 20.6 27.3 20.6                                 SCENARIO                     PARAMETER
1 83 10.0 75.0 20.6 27.3 20.6                                 SCENARIO                     PARAMETER
1 83 15.0 75.0 20.6 27.3 20.6                                 SCENARIO                     PARAMETER
1 83 20.0 75.0 20.6 27.3 20.6                                 SCENARIO                     PARAMETER
1 83 25.0 75.0 20.6 27.3 20.6                                 SCENARIO                     PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

Because of the two new vehicle types (LDDVs and LDDTs), MOBILE2 could not initially run this example. By incorporating the vehicle registration mix distributions for the two vehicle types, this example could be run. However, the LDDV registration mix distribution must equal the LDGV registration mix distribution. Similarly, the LDDT registration mix distribution must equal the LDGT1 registration mix distribution. Further information is available in section 2.2.2.

```
WARNING:  0.999     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.999     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:   1.00     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.500E-02 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.130E-01 REGISTRATION WITH ZERO MILEAGE

EXAMPLE 7: USER-SUPPLIED VEHICLE REGISTRATION DATA

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983      TEMP: 75.0(F)         0.778/0.080/0.034/0.037/0.034/0.011
 REGION: 49-STATE      5.0/ 5.0/ 5.0 MPH ( 5.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG      HDD       MC     ALL MODES
  TOTAL HC:     9.85     11.59     21.02     38.68     8.34     14.54     11.22
EXHAUST  CO:  115.03    129.36    218.48    665.92    34.51     87.04    134.17
EXHAUST NOX:    1.82      2.36      3.48      8.73    39.94      0.81      3.48
-------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983      TEMP: 75.0(F)         0.778/0.080/0.034/0.037/0.034/0.011
 REGION: 49-STATE     10.0/10.0/10.0 MPH (10.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG      HDD       MC     ALL MODES
  TOTAL HC:     5.45      6.48     11.42     26.56     6.55      8.83      6.48
EXHAUST  CO:   58.41     65.90    106.19    443.05    23.79     41.82     72.06
EXHAUST NOX:    1.82      2.33      3.46      9.17    33.13      0.73      3.25
-------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983      TEMP: 75.0(F)         0.778/0.080/0.034/0.037/0.034/0.011
 REGION: 49-STATE     15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                       COMPDSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG      HDD       MC     ALL MODES
  TOTAL HC:     4.02      4.81      8.30     19.26     5.26      6.90      4.78
EXHAUST  CO:   41.65     46.80     71.27    311.43    17.17     27.14     51.03
EXHAUST NOX:    1.97      2.50      3.63      9.62    28.48      0.75      3.23
-------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983      TEMP: 75.0(F)         0.778/0.080/0.034/0.037/0.034/0.011
 REGION: 49-STATE     20.0/20.0/20.0 MPH (20.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG      HDD       MC     ALL MODES
  TOTAL HC:     3.32      4.00      6.84     14.73     4.31      6.01      3.91
EXHAUST  CO:   33.67     37.76     55.32    231.29    12.97     20.43     40.37
EXHAUST NOX:    2.18      2.77      3.89     10.06    25.37      0.81      3.33
-------------------------------------------------------------------------------
                                  VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983      TEMP: 75.0(F)         0.778/0.080/0.034/0.037/0.034/0.011
 REGION: 49-STATE     25.0/25.0/25.0 MPH (25.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG      HDD       MC     ALL MODES
```

4.2.7 MOBILE1 EXAMPLE#7 Output

```
   TOTAL HC:     2.83      3.44      5.90     11.84      3.62      5.47      3.31
EXHAUST  CO:    27.75     31.22     45.12    181.49     10.25     16.36     32.90
EXHAUST NOX:     2.40      3.04      4.16     10.50     23.41      0.90      3.49
-------------------------------------------------------------------------------------
```

4.2.7 MOBILE1 EXAMPLE#7 Output (cont.)

4.2.8 MOBILE1 EXAMPLE # 8

```
Input Record  (80 columns)                                          Description              Section

0         IPROMT                                                    FLAG                     CONTROL
EXAMPLE 8: USER-SUPPLIED MILEAGE ACCRUAL & REGISTRATION DATA        TITLE                    CONTROL
1         INFLAG                                                    FLAG                     CONTROL
0         SPDFLG                                                    FLAG                     CONTROL
0         VMFLAG                                                    FLAG                     CONTROL
3         MYMRFG                                                    FLAG                     CONTROL
0         ALTFLG                                                    FLAG                     CONTROL
0         IMFLG                                                     FLAG                     CONTROL
0         ALHFLG                                                    FLAG                     CONTROL
0         TRKFLG                                                    FLAG                     CONTROL
1         IFORM                                                     FLAG                     CONTROL
0         PRTFLG                                                    FLAG                     CONTROL
0         ICEVFG                                                    FLAG                     CONTROL
0         IDLFLG                                                    FLAG                     CONTROL
0         NMHFLG                                                    FLAG                     CONTROL
0         UNFFLG                                                    FLAG                     CONTROL
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                  MYM  LDV ,AGES  1-10     ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                  MYM  LDV ,AGES 11-20     ONE-TIME DATA
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                  MYM  LDT1,AGES  1-10     ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                  MYM  LDT1,AGES 11-20     ONE-TIME DATA
 .157 .157 .141 .126 .113 .102 .094 .086 .080 .075                  MYM  LDT2,AGES  1-10     ONE-TIME DATA
 .071 .066 .063 .060 .055 .052 .050 .047 .044 .041                  MYM  LDT2,AGES 11-20     ONE-TIME DATA
 .190 .190 .179 .165 .150 .135 .120 .106 .095 .086                  MYM  HDG ,AGES  1-10     ONE-TIME DATA
 .078 .070 .063 .059 .053 .049 .047 .046 .044 .042                  MYM  HDG ,AGES 11-20     ONE-TIME DATA
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                  MYM  LDV ,AGES  1-10     ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                  MYM  LDV ,AGES 11-20     ONE-TIME DATA
 .159 .150 .140 .131 .122 .113 .103 .094 .085 .076                  MYM  LDT1,AGES  1-10     ONE-TIME DATA
 .067 .066 .062 .059 .055 .051 .050 .047 .044 .044                  MYM  LDT1,AGES 11-20     ONE-TIME DATA
 .736 .736 .699 .633 .566 .500 .456 .412 .382 .360                  MYM  HDD ,AGES  1-10     ONE-TIME DATA
 .346 .338 .331 .324 .309 .287 .257 .213 .184 .154                  MYM  HDD ,AGES 11-20     ONE-TIME DATA
.0201.0251.0207.0185.0172.0162.0155.0149.0143.0139                  MYM  MC  ,AGES  1-10     ONE-TIME DATA
.0135.0132.0129.0127.0125.0123.0122.0121.0120.0119                  MYM  MC  ,AGES 11-20     ONE-TIME DATA
 .075 .107 .107 .106 .100 .092 .085 .077 .066 .052                  MYR  LDV ,AGES  1-10     ONE-TIME DATA
 .039 .027 .018 .014 .009 .006 .005 .005 .005 .004                  MYR  LDV ,AGES 11-20     ONE-TIME DATA
 .061 .095 .094 .103 .083 .076 .076 .063 .054 .043                  MYR  LDT1,AGES  1-10     ONE-TIME DATA
 .036 .024 .030 .028 .026 .024 .022 .020 .018 .016                  MYR  LDT1,AGES 11-20     ONE-TIME DATA
 .037 .070 .078 .086 .075 .075 .075 .068 .059 .053                  MYR  LDT2,AGES  1-10     ONE-TIME DATA
 .044 .032 .038 .036 .034 .032 .030 .028 .026 .024                  MYR  LDT2,AGES 11-20     ONE-TIME DATA
 .037 .070 .078 .086 .075 .075 .075 .068 .059 .053                  MYR  HDG ,AGES  1-10     ONE-TIME DATA
 .044 .032 .038 .036 .034 .032 .030 .028 .026 .024                  MYR  HDG ,AGES 11-20     ONE-TIME DATA
 .075 .107 .107 .106 .100 .092 .085 .077 .066 .052                  MYR  LDV ,AGES  1-10     ONE-TIME DATA
 .039 .027 .018 .014 .009 .006 .005 .005 .005 .004                  MYR  LDV ,AGES 11-20     ONE-TIME DATA
 .061 .095 .094 .103 .083 .076 .076 .063 .054 .043                  MYR  LDT1,AGES  1-10     ONE-TIME DATA
 .036 .024 .030 .028 .026 .024 .022 .020 .018 .016                  MYR  LDT1,AGES 11-20     ONE-TIME DATA
 .077 .135 .134 .131 .099 .090 .082 .062 .045 .033                  MYR  HDD ,AGES  1-10     ONE-TIME DATA
 .025 .015 .013 .011 .010 .008 .007 .006 .005 .004                  MYR  HDD ,AGES 11-20     ONE-TIME DATA
 .105 .225 .206 .149 .097 .062 .046 .033 .029 .023                  MYR  MC  ,AGES  1-10     ONE-TIME DATA
 .008 .005 .013 .0   .0   .0   .0   .0   .0   .0                    MYR  MC  ,AGES 11-20     ONE-TIME DATA
1 83  5.0 75.0 20.6 27.3 20.6                                       SCENARIO                 PARAMETER
1 83 10.0 75.0 20.6 27.3 20.6                                       SCENARIO                 PARAMETER
1 83 15.0 75.0 20.6 27.3 20.6                                       SCENARIO                 PARAMETER
1 83 20.0 75.0 20.6 27.3 20.6                                       SCENARIO                 PARAMETER
1 83 25.0 75.0 20.6 27.3 20.6                                       SCENARIO                 PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

4.2.8 MOBILE1 EXAMPLE#8 Input

The LDDV and LDDT vehicle types prevented this example from running through MOBILE2. See comments for the mileage accumulation rate distribution in section 4.2.6 and comments for the vehicle registration mix distribution in section 4.2.7.

4.2.8 MOBILE1 EXAMPLE#6 Input (cont.)

```
WARNING:  0.999     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.999     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:   1.00     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.127E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.125E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.123E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.122E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.121E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.120E-01 MILEAGE WITH ZERO REGISTRATION
WARNING:  0.119E-01 MILEAGE WITH ZERO REGISTRATION

EXAMPLE 8: USER-SUPPLIED MILEAGE ACCRUAL & REGISTRATION DATA

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
CAL. YEAR: 1983      TEMP: 75.0(F)        0.763/0.089/0.036/0.037/0.038/0.010
REGION: 49-STATE      5.0/ 5.0/ 5.0 MPH ( 5.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1     LDT2     HDG      HDD      MC     ALL MODES
   TOTAL HC:     9.27    12.09    21.24    38.51     8.54    16.32     10.87
EXHAUST  CO:   107.06   134.33   221.81   666.71    35.19    92.18    128.86
EXHAUST NOX:     1.75     2.38     3.48     8.74    40.42     0.75      3.61
-------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
CAL. YEAR: 1983      TEMP: 75.0(F)        0.763/0.089/0.036/0.037/0.038/0.010
REGION: 49-STATE     10.0/10.0/10.0 MPH (10.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1     LDT2     HDG      HDD      MC     ALL MODES
   TOTAL HC:     5.13     6.75    11.52    26.44     6.71     9.73      6.29
EXHAUST  CO:    54.69    68.50   107.79   443.57    24.26    44.77     69.68
EXHAUST NOX:     1.75     2.35     3.46     9.18    33.53     0.68      3.35
-------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
CAL. YEAR: 1983      TEMP: 75.0(F)        0.763/0.089/0.036/0.037/0.038/0.010
REGION: 49-STATE     15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1     LDT2     HDG      HDD      MC     ALL MODES
   TOTAL HC:     3.79     5.00     8.37    19.17     5.38     7.50      4.65
EXHAUST  CO:    39.29    48.75    72.36   311.80    17.51    29.31     49.56
EXHAUST NOX:     1.90     2.53     3.63     9.63    28.83     0.69      3.32
-------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
CAL. YEAR: 1983      TEMP: 75.0(F)        0.763/0.089/0.036/0.037/0.038/0.010
REGION: 49-STATE     20.0/20.0/20.0 MPH (20.0) 20.6/ 27.3/ 20.6

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                 LDV      LDT1     LDT2     HDG      HDD      MC     ALL MODES
   TOTAL HC:     3.12     4.15     6.89    14.65     4.41     6.48      3.80
EXHAUST  CO:    31.92    39.39    56.18   231.56    13.22    22.27     39.28
EXHAUST NOX:     2.11     2.80     3.89    10.07    25.67     0.75      3.40
-------------------------------------------------------------------------------
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
```

4.2.8 MOBILE1 EXAMPLE#8 Output

```
CAL. YEAR: 1983     TEMP: 75.0(F)          0.763/0.089/0.036/0.037/0.038/0.010
REGION: 49-STATE    25.0/25.0/25.0 MPH (25.0) 20.6/ 27.3/ 20.6

                          COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV        LDT1       LDT2      HDG        HDD        MC     ALL MODES
  TOTAL HC:        2.66       3.56       5.93     11.77       3.70       5.86      3.21
EXHAUST  CO:      26.35      32.56      45.80    181.70      10.45      18.03     32.04
EXHAUST NOX:       2.33       3.08       4.16     10.51      23.69       0.83      3.54
------------------------------------------------------------------------------------------
```

4.2.8 MOBILE1 EXAMPLE#8 Output (cont.)

4.2.9 MOBILE1 EXAMPLE # 9

```
Input Record  (80 columns)                                                         Description                       Section

0         IPROMT                                                                   FLAG                              CONTROL
EXAMPLE 9: EMISSION FACTOR MODIFICATION DATA                                       TITLE                             CONTROL
1         INFLAG                                                                   FLAG                              CONTROL
0         SPDFLG                                                                   FLAG                              CONTROL
0         VMFLAG                                                                   FLAG                              CONTROL
0         MYMRFG                                                                   FLAG                              CONTROL
1         ALTFLG                                                                   FLAG                              CONTROL
0         IMFLG                                                                    FLAG                              CONTROL
0         ALHFLG                                                                   FLAG                              CONTROL
0         TRKFLG                                                                   FLAG                              CONTROL
1         IFORM                                                                    FLAG                              CONTROL
0         PRTFLG                                                                   FLAG                              CONTROL
0         ICEVFG                                                                   FLAG                              CONTROL
0         IDLFLG                                                                   FLAG                              CONTROL
0         NMHFLG                                                                   FLAG                              CONTROL
0         UNFFLG                                                                   FLAG                              CONTROL
 4                                                                                 ALTERNATE BASIC EMISSION RATE     ONE-TIME DATA
1 1 1 80 82   1.13   0.23                                                          ALTERNATE BASIC EMISSION RATE     ONE-TIME DATA
1 1 1 83 95   0.13   0.46                                                          ALTERNATE BASIC EMISSION RATE     ONE-TIME DATA
1 1 2 80 80  18.60   2.80                                                          ALTERNATE BASIC EMISSION RATE     ONE-TIME DATA
1 1 2 81 85   2.10   3.00                                                          ALTERNATE BASIC EMISSION RATE     ONE-TIME DATA
1 78 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER
1 79 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER
1 80 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER
1 81 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER
1 82 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER
1 83 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER
1 84 15.0 75.0 20.6 27.3 20.6                                                      SCENARIO                          PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

The example ran in MOBILE2 without any modification.

4.2.9 MOBILE1 EXAMPLE#9 Input

```
WARNING: EQUATION  1 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=1
WARNING: EQUATION  2 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=1
WARNING: EQUATION  3 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=2
WARNING: EQUATION  4 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=2

EXAMPLE 9: EMISSION FACTOR MODIFICATION DATA

   EMISSION FACTOR MODIFICATION PROFILE:
REGION  VEH.  POLLUTANT  FIRST MY  LAST MY    BASE    DR   ALTERED
------  ----  ---------  --------  -------    ----   ---   -------
  1      1        1        1980      1982     1.13   0.23    YES
  1      1        1        1983      1995     0.13   0.46    YES
  1      1        2        1980      1980    18.60   2.80    YES
  1      1        2        1981      1985     2.10   3.00    YES

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
----------------------------------------------------------------------------------
                               VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1978     TEMP: 75.0(F)        0.785/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV      LDT1      LDT2      HDG      HDD      MC    ALL MODES
   TOTAL HC:       7.16     7.35     11.02     24.55     5.35    13.33     8.08
EXHAUST  CO:      69.79    67.76     86.62    331.85    17.42    43.83    79.36
EXHAUST NOX:       3.01     3.18      4.69      9.61    28.74     0.23     4.20
----------------------------------------------------------------------------------
                               VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1979     TEMP: 75.0(F)        0.783/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV      LDT1      LDT2      HDG      HDD      MC    ALL MODES
   TOTAL HC:       6.56     6.75      9.90     23.97     5.35    11.13     7.45
EXHAUST  CO:      65.25    63.44     79.06    331.61    17.42    39.97    74.95
EXHAUST NOX:       2.81     3.05      4.29      9.57    28.74     0.37     4.01
----------------------------------------------------------------------------------
                               VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1980     TEMP: 75.0(F)        0.781/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV      LDT1      LDT2      HDG      HDD      MC    ALL MODES
   TOTAL HC:       6.01     6.14      7.31     21.68     5.35     9.78     6.72
EXHAUST  CO:      60.72    58.05     61.31    318.54    17.42    37.64    69.37
EXHAUST NOX:       2.65     2.86      3.46      9.56    28.74     0.46     3.83
----------------------------------------------------------------------------------
                               VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1981     TEMP: 75.0(F)        0.777/0.082/0.046/0.042/0.033/0.009
 REGION: 49-STATE    15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                     COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV      LDT1      LDT2      HDG      HDD      MC    ALL MODES
   TOTAL HC:       5.55     5.64      5.56     19.84     5.35     8.69     6.13
EXHAUST  CO:      56.29    53.73     49.06    307.71    17.42    33.72    64.28
EXHAUST NOX:       2.47     2.72      2.91      9.56    28.74     0.58     3.65
----------------------------------------------------------------------------------
                               VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1982     TEMP: 75.0(F)        0.773/0.082/0.046/0.042/0.033/0.009
```

4.2.9 MOBILE1 EXAMPLE#9 Output

```
 REGION: 49-STATE     15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV       LDT1      LDT2      HDG       HDD        MC    ALL MODES
   TOTAL HC:       5.13      5.19      4.53     18.49      5.35      7.88      5.63
EXHAUST  CO:      50.96     50.30     41.44    299.84     17.42     30.79     58.90
EXHAUST NOX:       2.25      2.63      2.61      9.58     28.74      0.66      3.46
-------------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1983      TEMP: 75.0(F)          0.766/0.081/0.046/0.042/0.033/0.009
 REGION: 49-STATE     15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV       LDT1      LDT2      HDG       HDD        MC    ALL MODES
   TOTAL HC:       4.76      4.79      3.96     17.07      5.35      7.34      5.20
EXHAUST  CO:      46.56     47.07     36.98    291.05     17.42     28.80     54.28
EXHAUST NOX:       2.08      2.54      2.47      9.59     28.74      0.71      3.31
-------------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1984      TEMP: 75.0(F)          0.758/0.080/0.046/0.042/0.033/0.009
 REGION: 49-STATE     15.0/15.0/15.0 MPH (15.0) 20.6/ 27.3/ 20.6

                         COMPOSITE EMISSION FACTORS (GM/MILE)
                   LDV       LDT1      LDT2      HDG       HDD        MC    ALL MODES
   TOTAL HC:       4.36      4.42      3.42     15.75      5.35      7.09      4.74
EXHAUST  CO:      43.03     43.63     32.35    282.39     17.42     27.44     50.35
EXHAUST NOX:       1.96      2.43      2.28      9.59     28.74      0.75      3.19
-------------------------------------------------------------------------------------
```

4.2.9 MOBILE1 EXAMPLE#2 Output (cont.)

4.2.10 MOBILE1 EXAMPLE # 10

```
Input Record  (80 columns)                                                Description         Section

0          IPROMT                                                         FLAG                CONTROL
EXAMPLE 10: LDV INSPECTION/MAINTENANCE                                    TITLE               CONTROL
1          INFLAG                                                         FLAG                CONTROL
0          SPDFLG                                                         FLAG                CONTROL
0          VMFLAG                                                         FLAG                CONTROL
0          MYMRFG                                                         FLAG                CONTROL
0          ALTFLG                                                         FLAG                CONTROL
1          IMFLG                                                          FLAG                CONTROL
0          ALHFLG                                                         FLAG                CONTROL
0          TRKFLG                                                         FLAG                CONTROL
1          IFORM                                                          FLAG                CONTROL
0          PRTFLG                                                         FLAG                CONTROL
0          ICEVFG                                                         FLAG                CONTROL
0          IDLFLG                                                         FLAG                CONTROL
0          NMHFLG                                                         FLAG                CONTROL
0          UNFFLG                                                         FLAG                CONTROL
79 30 1 68 99                                                             LDV I/M DATA        ONE-TIME DATA
1 75 23.0 75.0 20.6 27.3 20.6                                             SCENARIO            PARAMETER
1 80 23.0 75.0 20.6 27.3 20.6                                             SCENARIO            PARAMETER
1 85 23.0 75.0 20.6 27.3 20.6                                             SCENARIO            PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

This example ran in MOBILE2 without any modification.

```
EXAMPLE 10: LDV INSPECTION/MAINTENANCE

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-----------------------------------------------------------------------------------
                                    VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1975     TEMP: 75.0(F)         0.786/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6
 LDGV I/M PROGRAM STARTING IN 1979
 STRINGENCY LEVEL 30% MECH.TRAINING: YES
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1968 THROUGH 1999
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                   COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:      7.33      7.35      8.85     17.66      3.94    10.24      7.75
EXHAUST  CO:     59.66     56.47     60.07    212.79     11.36    31.95     64.00
EXHAUST NOX:      3.86      3.81      5.70     10.49     24.29     0.25      4.86
-----------------------------------------------------------------------------------
                                    VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1980     TEMP: 75.0(F)         0.781/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6
 LDGV I/M PROGRAM STARTING IN 1979
 STRINGENCY LEVEL 30% MECH.TRAINING: YES
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1968 THROUGH 1999
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                   COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:      3.87      4.74      5.43     14.29      3.94     7.67      4.47
EXHAUST  CO:     34.04     41.04     41.36    203.19     11.36    25.72     41.05
EXHAUST NOX:      3.03      3.29      3.89     10.27     24.29     0.52      4.06
-----------------------------------------------------------------------------------
                                    VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 75.0(F)         0.750/0.079/0.046/0.042/0.033/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6
 LDGV I/M PROGRAM STARTING IN 1979
 STRINGENCY LEVEL 30% MECH.TRAINING: YES
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1968 THROUGH 1999
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                   COMPOSITE EMISSION FACTORS (GM/MILE)
                  LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:      1.84      3.02      2.14      8.97      3.94     5.71      2.29
EXHAUST  CO:     16.39     28.61     19.32    153.11     11.36    17.37     22.47
EXHAUST NOX:      2.19      7.67      2.32     10.82     24.29     0.89      3.27
-----------------------------------------------------------------------------------
```

4.2.10 MOBILE1 EXAMPLE#10 Output

4.2.11 MOBILE1 EXAMPLE # 11

```
Input Record  (80 columns)                                                Description                     Section

0         IPROMT                                                          FLAG                            CONTROL
EXAMPLE 11: ADDITONAL LDV CORRECTION FACTORS                              TITLE                           CONTROL
1         INFLAG                                                          FLAG                            CONTROL
0         SPDFLG                                                          FLAG                            CONTROL
0         VMFLAG                                                          FLAG                            CONTROL
0         MYMRFG                                                          FLAG                            CONTROL
0         ALTFLG                                                          FLAG                            CONTROL
0         IMFLG                                                           FLAG                            CONTROL
1         ALHFLG                                                          FLAG                            CONTROL
0         TRKFLG                                                          FLAG                            CONTROL
1         IFORM                                                           FLAG                            CONTROL
0         PRTFLG                                                          FLAG                            CONTROL
0         ICEVFG                                                          FLAG                            CONTROL
0         IDLFLG                                                          FLAG                            CONTROL
0         NMHFLG                                                          FLAG                            CONTROL
0         UNFFLG                                                          FLAG                            CONTROL
1 75 23.0 75.0 20.6 27.3 20.6                                             SCENARIO                        PARAMETER
0.40 .38 .12 .14 .09 83.                                                  ADDITIONAL LD CORR. FACTORS     PARAMETER
1 80 23.0 75.0 20.6 27.3 20.6                                             SCENARIO                        PARAMETER
0.40 .08 .12 .14 .09 83.                                                  ADDITIONAL LD CORR. FACTORS     PARAMETER
1 85 23.0 75.0 20.6 27.3 20.6                                             SCENARIO                        PARAMETER
0.40 .08 .12 .14 .09 83.                                                  ADDITIONAL LD CORR. FACTORS     PARAMETER

....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8
```

This example ran in MOBILE2 without any modification.

```
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.


EXAMPLE 11: ADDITONAL LDV CORRECTION FACTORS

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
----------------------------------------------------------------------------
                                     VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1975      TEMP: 75.0(F)          0.786/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE     23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

  AC:  0.50  XLOAD:   0.08   0.12   0.14  TRAILR:   0.00  ABSHUM:  83.00

                        COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV       LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:        7.50      7.61      8.20     17.66      3.94    10.24      7.99
 EXHAUST  CO:      71.50     67.50     70.87    212.79     11.36    31.95     74.78
 EXHAUST NOX:       4.24      4.06      6.08     10.49     24.29     0.24      5.20
----------------------------------------------------------------------------
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.
                                     VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1980      TEMP: 75.0(F)          0.781/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE     23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

  AC:  0.80  XLOAD:   0.08   0.12   0.14  TRAILR:   0.00  ABSHUM:  83.00

                        COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV       LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:        4.70      4.94      5.72     14.20      3.94     7.67      5.21
 EXHAUST  CO:      54.02     52.00     50.71    203.19     11.36    25.72     57.08
 EXHAUST NOX:       3.41      3.54      4.23     10.27     24.29     0.50      4.40
----------------------------------------------------------------------------
COMMENT:   A/C CORRECTION FACTOR WILL BE CALCULATED.
           VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.
                                     VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985      TEMP: 75.0(F)          0.780/0.078/0.046/0.042/0.033/0.009
 REGION: 49-STATE     23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

  AC:  0.90  XLOAD:   0.08   0.12   0.14  TRAILR:   0.00  ABSHUM:  83.00

                        COMPOSITE EMISSION FACTORS (GM/MILE)
                    LDV       LDT1      LDT2      HDG       HDD       MC     ALL MODES
   TOTAL HC:        2.80      3.17      2.20      8.87      3.94     5.71      3.11
 EXHAUST  CO:      38.81     37.77     28.28    163.11     11.36    17.37     40.28
 EXHAUST NOX:       2.40      2.88      2.51     10.82     24.29     0.86      3.53
----------------------------------------------------------------------------
```

4.2.11 MOBILE3 EXAMPLE11 Output

4.2.12 MOBILE1 EXAMPLE # 12

```
Input Record  (80 columns)                                                   Description                  Section

0        IPROMT                                                              FLAG                         CONTROL
EXAMPLE 12: ADDITONAL HDV CORRECTION FACTORS                                 TITLE                        CONTROL
1        INFLAG                                                              FLAG                         CONTROL
0        SPDFLG                                                              FLAG                         CONTROL
0        VMFLAG                                                              FLAG                         CONTROL
0        MYMRFG                                                              FLAG                         CONTROL
0        ALTFLG                                                              FLAG                         CONTROL
0        IMFLG                                                               FLAG                         CONTROL
0        ALHFLG                                                              FLAG                         CONTROL
1        TRKFLG                                                              FLAG                         CONTROL
1        IFORM                                                               FLAG                         CONTROL
0        PRTFLG                                                              FLAG                         CONTROL
0        ICEVFG                                                              FLAG                         CONTROL
0        IDLFLG                                                              FLAG                         CONTROL
0        NMHFLG                                                              FLAG                         CONTROL
0        UNFFLG                                                              FLAG                         CONTROL
1 75 23.0 75.0 20.6 27.3 20.6                                                SCENARIO                     PARAMETER
250044000 350. 555.                                                          HD POWER/WT CORR. FACTOR     PARAMETER
1 80 23.0 75.0 20.6 27.3 20.6                                                SCENARIO                     PARAMETER
250044000 350. 555.                                                          HD POWER/WT CORR. FACTOR     PARAMETER
1 85 23.0 75.0 20.6 27.3 20.6                                                SCENARIO                     PARAMETER
250044000 350. 555.                                                          HD POWER/WT CORR. FACTOR     PARAMETER

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

This example ran in MOBILE2 without any modification.

```
WARNING: FLAG TRKFLG IGNORED.  "TRKOPC" NO LONGER USED.

EXAMPLE 12: ADDITONAL HDV CORRECTION FACTORS

  *   TOTAL HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV    LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1975     TEMP: 75.0(F)          0.786/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

                    COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:     7.33     7.35      8.85     17.66      3.94     10.24      7.75
EXHAUST  CO:    59.66    56.47     60.07    212.79     11.36     31.95     64.00
EXHAUST NOX:     3.86     3.81      5.70     10.49     24.29      0.25      4.86
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV    LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1980     TEMP: 75.0(F)          0.781/0.083/0.047/0.042/0.033/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

                    COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:     4.57     4.74      5.43     14.29      3.94      7.67      5.02
EXHAUST  CO:    42.01    41.04     41.36    203.19     11.36     25.72     47.27
EXHAUST NOX:     3.03     3.29      3.89     10.27     24.29      0.52      4.06
-------------------------------------------------------------------------------
                                   VEH. TYPE:  LDV    LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 75.0(F)          0.750/0.079/0.046/0.042/0.033/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

                    COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG       HDD       MC    ALL MODES
   TOTAL HC:     2.76     3.02      2.14      8.97      3.94      5.71      2.99
EXHAUST  CO:    28.50    28.61     19.32    153.11     11.36     17.37     31.56
EXHAUST NOX:     2.19     2.67      2.32     10.82     24.29      0.89      3.27
-------------------------------------------------------------------------------
```

4.2.12 MOBILE1 EXAMPLE#12 Output

```
4.2.13 MOBILE1  EXAMPLE # 13

Input Record  (80 columns)                                                              Description                        Section

1         IPROMT                                                                        FLAG                               CONTROL
EXAMPLE 13: ALL FLAGS SET                                                               TITLE                              CONTROL
1         INFLAG                                                                        FLAG                               CONTROL
0         SPDFLG                                                                        FLAG                               CONTROL
1         VMFLAG                                                                        FLAG                               CONTROL
2         MYMRFG                                                                        FLAG                               CONTROL
1         ALTFLG                                                                        FLAG                               CONTROL
1         IMFLG                                                                         FLAG                               CONTROL
1         ALHFLG                                                                        FLAG                               CONTROL
1         TRKFLG                                                                        FLAG                               CONTROL
1         IFORM                                                                         FLAG                               CONTROL
1         PRTFLG                                                                        FLAG                               CONTROL
1         ICEVFG                                                                        FLAG                               CONTROL
1         IDLFLG                                                                        FLAG                               CONTROL
1         NMHFLG                                                                        FLAG                               CONTROL
0         UNFFLG                                                                        FLAG                               CONTROL
 .075 .107 .107 .106 .100 .092 .085 .077 .066 .052                                      MYR  LDV ,AGES  1-10               ONE-TIME DATA
 .039 .027 .018 .014 .009 .006 .005 .005 .005 .004                                      MYR  LDV ,AGES 11-20               ONE-TIME DATA
 .061 .095 .094 .103 .083 .076 .076 .063 .054 .043                                      MYR  LDT1,AGES  1-10               ONE-TIME DATA
 .036 .024 .030 .028 .026 .024 .022 .020 .018 .016                                      MYR  LDT1,AGES 11-20               ONE-TIME DATA
 .037 .070 .078 .086 .075 .075 .075 .068 .059 .053                                      MYR  LDT2,AGES  1-10               ONE-TIME DATA
 .044 .032 .038 .036 .034 .032 .030 .028 .026 .024                                      MYR  LDT2,AGES 11-20               ONE-TIME DATA
 .037 .070 .078 .086 .075 .075 .075 .068 .059 .053                                      MYR  HDG ,AGES  1-10               ONE-TIME DATA
 .044 .032 .038 .036 .034 .032 .030 .028 .026 .024                                      MYR  HDG ,AGES 11-20               ONE-TIME DATA
 .075 .107 .107 .106 .100 .092 .085 .077 .066 .052                                      MYR  LDV ,AGES  1-10               ONE-TIME DATA
 .039 .027 .018 .014 .009 .006 .005 .005 .005 .004                                      MYR  LDV ,AGES 11-20               ONE-TIME DATA
 .061 .095 .094 .103 .083 .076 .076 .063 .054 .043                                      MYR  LDT1,AGES  1-10               ONE-TIME DATA
 .036 .024 .030 .028 .026 .024 .022 .020 .018 .016                                      MYR  LDT1,AGES 11-20               ONE-TIME DATA
 .077 .135 .134 .131 .099 .090 .082 .062 .045 .033                                      MYR  HDD ,AGES  1-10               ONE-TIME DATA
 .025 .015 .013 .011 .010 .008 .007 .006 .005 .004                                      MYR  HDD ,AGES 11-20               ONE-TIME DATA
 .105 .225 .206 .149 .097 .062 .046 .033 .029 .023                                      MYR  MC  ,AGES  1-10               ONE-TIME DATA
 .008 .005 .013 .0   .0   .0   .0   .0   .0   .0                                        MYR  MC  ,AGES 11-20               ONE-TIME DATA
  4                                                                                     ALTERNATE BASIC EMISSION RATES     ONE-TIME DATA
1 1 1 80 82   1.13   0.23                                                               ALTERNATE BASIC EMISSION RATES     ONE-TIME DATA
1 1 1 83 95   0.13   0.46                                                               ALTERNATE BASIC EMISSION RATES     ONE-TIME DATA
1 1 2 80 80  18.60   2.80                                                               ALTERNATE BASIC EMISSION RATES     ONE-TIME DATA
1 1 2 81 85   2.10   3.00                                                               ALTERNATE BASIC EMISSION RATES     ONE-TIME DATA
79 30 1 68 99                                                                           LDV I/M DATA                       ONE-TIME DATA
1 75 23.0 75.0 20.6 27.3 20.6                                                           SCENARIO                           PARAMETER
.657.083.057.115.000.000.079.009                                                        VMT MIX                            PARAMETER
0.40 .08 .12 .14 .09 83.                                                                ADDITIONAL LD CORR. FACTORS        PARAMETER
250044000 350. 555.                                                                     HD POWER/WT CORR. FACTOR           PARAMETER
1 80 23.0 75.0 20.6 27.3 20.6                                                           SCENARIO                           PARAMETER
.657.083.057.115.000.000.079.009                                                        VMT MIX                            PARAMETER
0.40 .08 .12 .14 .09 83.                                                                ADDITIONAL LD CORR. FACTORS        PARAMETER
250044000 350. 555.                                                                     HD POWER/WT CORR. FACTOR           PARAMETER
1 85 23.0 75.0 20.6 27.3 20.6                                                           SCENARIO                           PARAMETER
.657.083.057.115.000.000.079.009                                                        VMT MIX                            PARAMETER
0.40 .08 .12 .14 .09 83.                                                                ADDITIONAL LD CORR. FACTORS        PARAMETER
250044000 350. 555.                                                                     HD POWER/WT CORR. FACTOR           PARAMETER
....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8
```

MOBILE2 could not run this example until modifications were made to (1) the VMT fractions and vehicle registration mix distributions for the LDDVs and LDDTs and (2) the three speed bag inputs. Also, the UNFFLG flag was changed to 0. See sections 4.2.3, 4.2.6, and 4.2.7 for further explanation.

4.2.13 MOBILE1 EXAMPLE#13 Input

```
ENTER PROJECT ID:
ENTER INFLAG:
ENTER SPDFLG:
ENTER VMFLAG:
ENTER MYMRFG:
ENTER ALTFLG:
ENTER IMFLG:
ENTER ALHFLG:
ENTER TRKFLG:
WARNING: FLAG TRKFLG IGNORED.  "TRKOPC" NO LONGER USED.
ENTER IFORM:
ENTER PRTFLG:
ENTER ICEVFG:
ENTER IDLFLG:
ENTER NMHFLG:
ENTER UNFFLG:


ENTER MYR AGES 1-10 FOR LDGV:
ENTER MYR AGES 11-20 FOR LDGV:
WARNING:  0.999     MYR SUM NOT = 1. (WILL NORMALIZE)
ENTER MYR AGES 1-10 FOR LDGT1:
ENTER MYR AGES 11-20 FOR LDGT1:
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
ENTER MYR AGES 1-10 FOR LDGT2:
ENTER MYR AGES 11-20 FOR LDGT2:
ENTER MYR AGES 1-10 FOR HDGV:
ENTER MYR AGES 11-20 FOR HDGV:
ENTER MYR AGES 1-10 FOR LDDV:
ENTER MYR AGES 11-20 FOR LDDV:
WARNING:  0.999     MYR SUM NOT = 1. (WILL NORMALIZE)
ENTER MYR AGES 1-10 FOR LDDT:
ENTER MYR AGES 11-20 FOR LDDT:
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
ENTER MYR AGES 1-10 FOR HDDV:
ENTER MYR AGES 11-20 FOR HDDV:
WARNING:  0.992     MYR SUM NOT = 1. (WILL NORMALIZE)
ENTER MYR AGES 1-10 FOR MC:
ENTER MYR AGES 11-20 FOR MC:
WARNING:   1.00     MYR SUM NOT = 1. (WILL NORMALIZE)
WARNING:  0.500E-02 REGISTRATION WITH ZERO MILEAGE
WARNING:  0.130E-01 REGISTRATION WITH ZERO MILEAGE

ENTER NO. OF NEW E.F. INTERCEPT/SLOPE PAIRS (I2)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,
LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)
WARNING: EQUATION  1 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=1
WARNING: EQUATION  2 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=1
WARNING: EQUATION  3 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=2
WARNING: EQUATION  4 ZEROES ALL IDLE COEFFICIENTS (AND TOTAL) FOR IR=1, IV=1, IP=2

ENTER YEAR I/M BEGINS, STRINGENCY, M.T. FLAG,
FIRST MODEL YEAR AND LAST MODEL YEAR OF PROG. BENEFITS
```

4.2.13 MOBILE1 EXAMPLE#13 Output

```
ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER HGWGT,HDWGT,HGCID,HDCID (VALUES WILL BE IGNORED)


EXAMPLE 13: ALL FLAGS SET

   EMISSION FACTOR MODIFICATION PROFILE:
REGION  VEH.  POLLUTANT  FIRST MY  LAST MY    BASE     DR   ALTERED
------  ----  ---------  --------  -------    ----    ---   -------
  1       1       1        1980      1982     1.13   0.23     YES
  1       1       1        1983      1995     0.13   0.46     YES
  1       1       2        1980      1980    18.60   2.80     YES
  1       1       2        1981      1985     2.10   3.00     YES

  *NON-METH HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS
--------------------------------------------------------------------------------
                             VEH. TYPE:  LDV    LDT1  LDT2  HDG    HDD   MC
 CAL. YEAR: 1975     TEMP: 75.0(F)        0.657/0.083/0.057/0.115/0.079/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

  AC:  0.90  XLOAD:   0.08   0.12   0.14  TRAILR:   0.09  ABSHUM:  83.00
 LDGV I/M PROGRAM STARTING IN 1979
 STRINGENCY LEVEL 30% MECH.TRAINING: YES
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1968 THROUGH 1999
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                       COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1     LDT2     HDG      HDD      MC    ALL MODES
NON-METH HC:    6.78     7.22    11.48    18.18     3.72     9.68     8.18
   *EVAP HC:    1.96     2.43     3.80     4.84     0.0      1.86     ----

                HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:    0.0      1.03     1.43     1.66     0.35     2.04     0.0
--------------------------------------------------------------------------------

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER HGWGT,HDWGT,HGCID,HDCID (VALUES WILL BE IGNORED)
                             VEH. TYPE:  LDV    LDT1  LDT2  HDG    HDD   MC
 CAL. YEAR: 1980     TEMP: 75.0(F)        0.657/0.083/0.057/0.115/0.079/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

  AC:  0.90  XLOAD:   0.08   0.12   0.14  TRAILR:   0.09  ABSHUM:  83.00
 LDGV I/M PROGRAM STARTING IN 1979
 STRINGENCY LEVEL 30% MECH.TRAINING: YES
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1968 THROUGH 1999
```

4.2.13 MOBILE1 EXAMPLE#13 Output (cont.)

```
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                    COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
NON-METH HC:    3.46     4.63      8.74     14.94      3.72      6.72     5.23
   *EVAP HC:    1.02     1.32      2.51      3.84      0.0       2.07     ----

                HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:    0.0      0.69      1.15      1.18      0.35      1.20     0.0
--------------------------------------------------------------------------------

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:

ENTER VMT SPLIT:

ENTER AC,XLOAD(3),TRAILR(1),ABSHUM
COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.
          VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.

ENTER HGWGT,HDWGT,HGCID,HDCID (VALUES WILL BE IGNORED)
                                VEH. TYPE:  LDV   LDT1  LDT2  HDG   HDD   MC
 CAL. YEAR: 1985     TEMP: 75.0(F)         0.657/0.083/0.057/0.115/0.079/0.009
 REGION: 49-STATE    23.0/23.0/23.0 MPH (23.0) 20.6/ 27.3/ 20.6

  AC:  0.90  XLOAD:   0.08   0.12   0.14  TRAILR:   0.09  ABSHUM:  83.00
 LDGV I/M PROGRAM STARTING IN 1979
 STRINGENCY LEVEL 30% MECH.TRAINING: YES
 I/M PROGRAM BENEFITS APPLY ONLY TO MODEL YEARS 1968 THROUGH 1999
 ATTENTION: THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4
   I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.

                    COMPOSITE EMISSION FACTORS (GM/MILE)
                LDV      LDT1      LDT2      HDG       HDD       MC     ALL MODES
NON-METH HC:    1.63     2.92      4.81     10.08      3.72      5.26     3.09
   *EVAP HC:    0.37     0.53      1.02      2.99      0.0       2.25     ----

                HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)
NM-IDLE  HC:    0.0      0.38      0.61      0.73      0.35      0.74     0.0
--------------------------------------------------------------------------------

ENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC:
```

4.2.13 MOBILE1 EXAMPLE#13 Output (cont.)

Chapter 5

MOBILE2 IMPLEMENTATIONS AND POSSIBLE MODIFICATIONS

5.0 INTRODUCTION

This chapter contains information that may be useful to users interested in MOBILE2's computer resource requirements, to users implementing MOBILE2 on their own computer systems, and to users who are considering making some of the usual software changes.

5.1 PROGRAM STORAGE REQUIREMENTS

The variety of computers and system configurations in use prohibits a precise statement of main storage requirements on each system. Nevertheless, the following should reflect MOBILE2's requirements on most systems. On EPA's Washington computer, an IBM 370/158 Mod I, MOBILE2 requires 201 Kilobytes of main storage (using the standard convention of 1 Kilobyte = 1024 bytes). This is 51,400 32-bit memory words.

A major effort has been made to reduce memory requirements. MOBILE1 required about 50,000 memory words; much of this was used by several large arrays. As MOBILE1 evolved into MOBILE2, program enhancements increased array requirements dramatically, until finally, MOBILE2 required about 150,000 words. This was considered excessive. An examination determined that many arrays were unnecessary because a function subprogram could be written to determine the value needed. Other arrays were identified that could be reduced or eliminated. These changes reduced the program to its present size.

5.2 PROGRAM EXECUTION TIME

MOBILE2 requires more time to process scenario records than does MOBILE1. This was expected due to changes made in reducing memory requirements. The following table provides a comparison of the execution time required by MOBILE1 and MOBILE2 to process input data containing varying numbers of scenarios.

Number of Scenarios	Average Execution Time (CPU Seconds) MOBILE1	MOBILE2	M2/M1	Average Time per Scenario (CPU Seconds) MOBILE1	MOBILE2
2	0.167	0.216	1.3	0.084	0.108
10	0.326	1.046	3.2	0.033	0.105
20	0.518	2.085	4.0	0.026	0.104
50	1.121	5.298	4.7	0.022	0.106
250	5.024	26.087	5.2	0.020	0.104

These estimates were generated on an AMDAHL 470/V8 computer.

Users who run MOBILE2 on a commercial time sharing system should expect MOBILE2 to cost more to run than MOBILE1. When MOBILE2 arrays were expanded, the program size increased by a ratio exceeding 1:3. As a crude approximation, one might expect time sharing cost to be proportional to the product of program size and execution time. If we assume MOBILE2 computational enhancements increase execution time by a ratio of about 2:3, we would expect MOBILE2 to cost four to five times as much to run as MOBILE1.

The trade-off of execution time for memory decreased program size by a ratio of about 3:1. Execution time, however, increased by a ratio of about 1:5. From this, one would expect the present version of MOBILE2 to cost five to six times as much to run on a time sharing system as MOBILE1. However, when MOBILE2 was actually run on a time sharing system, we found MOBILE2 performed somewhat better than this when the number of scenarios was small and performed slightly worse when the number was large.

5.3 DEVIATIONS FROM FORTRAN STANDARD ANSI X3.9-1966

Users who wish to run MOBILE2 on other computers may need to change the program because of FORTRAN compiler incompatibilities. This section lists known deviations of MOBILE2 from the FORTRAN language standard ANSI X3.9-1966 published by the American National Standards Institute. Most conversion problems will be included in this list.

5.3.1 Array Dimensions

Some MOBILE2 arrays are defined to have four or five dimensions; the ANSI standard permits a maximum of three.

5.3.2 Character Data

Hollerith data is defined in MOBILE2 format statements by means of single quotation marks, while the ANSI standard requires use of the nH format specification.

MOBILE2 stores four characters in integer variables and array elements (A4 format). The ANSI standard only guarantees that one character can be stored in an integer variable (A1 format); therefore, MOBILE2 may be incompatible with some computer systems in this respect.

MOBILE2 assigns initial values of character data in integer data statements by means of single quotation marks. Again, the ANSI standard requires use of the nH format specification.

5.3.3 Array Data Initialization

MOBILE2 uses implied do-loops to initialize arrays in data statements. The ANSI standard requires that programs specify and initialize individual array elements. Each array element must be identified by means of an explicit subscript.

5.3.4 Non-Standard Characters

MOBILE2 uses some characters undefined in the ANSI standard. These include the single quotation mark('), double quotation mark("), pound sign (#), semicolon (;), and colon(:).

5.3.5 Input Error and End-of-File

MOBILE2 uses the ERR= option in READ statements to process input conversion errors and the END= option to process an end-of-file. Neither option is supported by the ANSI standard.

5.3.6 Comment Lines

MOBILE2 has comment lines interspersed with the continuation lines of data initialization statements. The ANSI standard states that comment lines may not be followed by continuation lines.

5.4 TYPICAL JOB STRUCTURE

Since job control language (JCL) is highly system dependent this manual does not provide examples. The general requirements for running a job are outlined here. Most users should have little difficulty implementing JCL to perform similar functions.

The simplest job structure for most systems is illustrated below:

```
JCL to sign on the computer system
JCL to compile MOBILE2 FORTRAN source code
               .
               .
               .
     MOBILE2 FORTRAN source code
               .
               .
               .
JCL to assign MOBILE2 I/O, catalog (link edit), and run MOBILE2
               .
               .
               .
     MOBILE2 input data
               .
               .
               .
```

MOBILE2 uses I/O device numbers stored in common IOUCOM. MOBILE2 I/O device assignments are:

4 = user-supplied inspection/maintenance credits (IOUIMD)
5 = general input data (IOUGEN)
6 = formatted reports (IOUREP)
6 = diagnostic messages (IOUERR)
6 = input prompting messages (IOUASK)

Users can change these device numbers by modifying source code data statements initializing common IOUCOM in Block Data Subprogram 21 or by assignment in IOUNEW (see Section 2.1.1).

The job structure illustrated above does not read user-supplied inspection/maintenance credits. Users can read inspection/maintenance credits by entering the data from another I/O device such as a disc file or magnetic tape. Alternately, users can merge the inspection/maintenance credits with other input and change the inspection/maintenance input device number from 4 to 5. Another useful change (especially for IFORM = 0 or 2) might alter IOUREP from 6 to some other unused unit number. Also, see Section 2.1.1.

5.5 STRUCTURAL DIFFERENCES BETWEEN MOBILE1 AND MOBILE2

MOBILE2 is a direct descendant of MOBILE1 that evolved through numerous small changes. Users will nevertheless notice that MOBILE2 is considerably different from MOBILE1. They will naturally have different opinions about the merit of some of the structural changes. We have attempted to make changes that provide major improvements and have tried to minimize disadvantages.

High priority has been given to 1) reducing MOBILE2 memory requirements and 2) simplifying data structures. We believe many users will need to run MOBILE2 on small computers and memory is usually the most limited resource. The result of the memory reduction effort was discussed in Section 5.1 above.

MOBILE1 data structures are complicated. Most MOBILE1 and MOBILE2 data arrays contain subscripts that are complicated functions of calendar years or model years. MOBILE1 was based on a design that emphasized calculating subscripts at all program levels and working directly with the subscripts. MOBILE2 works directly with the calendar and model years. The MOBILE2 structure increases the number of subprograms and lines of source code. However, the code and arrays are now simpler. The new structure is directly responsible for the memory reduction.

We have not tried to preserve the historical internal structure and logic of MOBILE1. MOBILE1 was complicated, making it difficult to determine whether the program was performing correctly. We believe that monitoring the performance of MOBILE2 will be easier.

5.6 SPEED CORRECTIONS FACTOR COEFFICIENT PRECISION

The speed correction factor coefficients in MOBILE SOURCE EMISSION FACTORS, March 1978 (EPA-400/9-78-005), and used in MOBILE1 are expressed to five significant digits. Subsequently, we learned six significant digit values were available. The six-digit values have been used in MOBILE2.

5.7 RE-IMPLEMENTING MOBILE1 OPTIONS NOT IN MOBILE2

As mentioned in Chapter 1, there are three MOBILE1 options that are no longer available in MOBILE2. These are the free format (list-directed) input, the three speed input option, and the unformatted output reports. Re-implementing these options is not difficult, as the program already contains much of the necessary code.

5.7.1 List Directed Input

The free format, or list directed, input option may be implemented by modifying subroutine INPUT. Generally, there are two READ statements in routine INPUT for each record. The first is of the form "IF(INFLAG.EQ.0) READ(IOUGEN,..." and the second is of the form "IF(INFLAG.EQ.1) READ(IOUGEN,...". Currently in MOBILE2, both READ statements are identical; that is, they both reference a labelled FORMAT statement and support fixed format input. The user wanting the free format option should modify the "IF(INFLAG.EQ.0) READ..." statements to support this type of input. This is usually done by replacing the FORMAT statement label by an asterik(*).

In the few cases where there is only one READ for a record (such as user supplied mileage accrual, registration mix, trips/day, or miles/day), the user can add the free format READ statement, and make each READ conditional upon the value of INFLAG.

5.7.2 Three Speed Input

The user can reimplement the three speed input option by modifying routine INPUT. INPUT currently allows only the values 0 (1-speed input) or 2 (8-speed input) for SPDFLG. The user should change two validation checks in INPUT to legalize the value 1 for SPDFLG. That is, the two occurences of "IF(SPDFLG.NE.0.AND.SPDFLG.NE.2) CALL QUITER..." should be changed to "IF(SPDFLG.LT.0.OR.SPDFLG.GT.2) CALL QUITER...". This is all that has to be done. There is a READ statement already in the program to handle 3-speed input.

The program then applies the first input speed to vehicle types LDGV, LDGT1, LDGT2, LDDV, and LDDT; the second input speed to HDGV and HDDV; and the third input speed to MC.

NOTE: This is different from the intention of 3-speed input as used in MOBILE1. In MOBILE1, the 3 speeds represented 3 bag speeds for vehicle types LDGV, LDGT1, LDGT2, and MC. In MOBILE2 there are no individual bag speeds; the 3 speeds represent the average speeds for 3 classes of vehicle types: LD, HD and MC. Also note that no additional capability is provided to the user with this option.

5.7.3 Unformatted Output

The user will have to add WRITE statements to the output routines if (s)he wants an unformatted output file to be written.

The device number for the unformatted output unit defaults to 9, and is stored in the variable IOUUNF in COMMON/IOUCOM/. The user may override this default by inputting a device number in column 5 of of the first input record (the IPROMT record, on which the I/O unit defaults may be overridden). So long as the device number does not conflict with the other device numbers used by the program (IOUIMD, IOUGEN, IOUREP, IOUERR and IOUASK; with defaults of 4, 5, 6, 6, and 6 respectively), the value of IOUUNF will be changed to the user's input value. If there is a device number conflict, the value of IOUUNF will be set to zero.

5.8 POSSIBLE PROGRAM CHANGES

This section describes some of the more common changes that users might make to their copy of the MOBILE2 program.

The changes mentioned here are suggestions for (a) user convenience (multiple control sections, hardcoding locality-specific data), (b) program enhancements (single record numeric output, evaluation of intermediate altitude emission factors), and (c) reducing computer resource requirements.

5.8.1 Multiple CONTROL Sections

The control flags and one-time data are input exactly once into MOBILE2. Since these values, once read in, cannot be altered, users must make multiple runs of MOBILE2 if they want to change values of control flags or one-time data. Multiple runs incur the additional overhead of loading the program each time and can be inconvenient to the user. Because of this, the user may want to change MOBILE2 to be capable of "starting over" with a new input stream upon some input cue. One method of doing this is described below. This approach has not been completely verified.

New CONTROL Sections would be entered after MOBILE2 has read one or more scenarios. Therefore, it is necessary to find a way of indicating that the program is to stop reading scenario records and begin reading CONTROL records. A simple way of doing this is to modify the program to look for a special value in the scenario record. For example, a literal value of "FLAG" could be used in columns 77 - 80.

Users would need to add a statement to subroutine INPUT immediately following the statements that read scenario records. This statement would cause a subroutine exit if the special value were found.

The MAIN program would also need to be modified. Users would need to insert a statement immediately following the second call to INPUT in MAIN. This statement would check for the special value and branch back to the beginning of MAIN if it were present.

We do not know whether repeating initialization steps causes problems. Users must determine this for themselves. Users should realize that new CONTROL Section data modifies all previous Control Section data. MOBILE2 does not revert to an original ("clean") version whenever new CONTROL Section data is entered (for example, user supplied mileage accrual, registration, or alternate emission rates remain and replace the MOBILE2 values).

5.8.2 Hardcoding Locality Specific Data

Users who plan to run a very large number of MOBILE2 data sets, and who wish to override the MOBILE2 default conditions with their own locality specific data in each data set, could consider modifying the BLOCK DATA routines and replacing the MOBILE2 data with their own data.

5.8.3 Single (Long) Record Numeric Output

Users may wish to print a single line of numeric output to a file or tape. This can be done by setting the report format code IFORM to 2 and changing subroutine OUTDT2. The slash '/' carriage controls must be deleted from format statements 100 and 300. The line tables 'A', 'B', and 'C' are no longer needed and can be deleted from the format statements.

The column headers for OUTDT2 are printed by subroutine OUTHD2. Of course, these will no longer line up with the columns if users change OUTDT2. Users can delete the OUTHD2 call from OUTPUT if the column headers are not desired. Alternatively, with a little more effort, users can change the OUTHD2 header formats.

If this method is used to print a single line of numeric output, each line will exceed 132 characters (to about 200, depending on the specific changes).

5.8.4 Intermediate Altitude

Users who wish to model non-California conditions at altitudes other than the standard 500 ft. low altitude or 5500 ft. high altitude conditions may alter the program to do so. The program is already set up to do much of the work. Intermediate altitude is handled as follows:

(1) The user inputs '5' as the region on the scenario record. MOBILE2 allows this and expects the next record to contain the altitude in an F6.0 format.

(2) The altitude must be between -200 ft. and 10,000 ft.

(3) Subroutine EFCALX will then calculate emission rates for both low and high altitude. The user must modify EFCALX by adding the intermediate altitude calculation methodology following statement 330.

(4) The output routines do not need to be modified.

5.8.5 Reducing Computer Resource Requirements

Users who wish to reduce MOBILE2's memory requirements can do so basically by removing arrays, or portions of arrays, which are not useful for their specific analyses.

The most significant reductions are:

1. Eliminate unnecessary regions. Many of the arrays contain data for three regions (low altitude non-California, high altitude non-California, and California). Users not requiring all three regions could downgrade the "region" dimension of the arrays, eliminate portions of the BLOCK DATA routines, and make appropriate indexing changes.

Eliminating one region would reduce MOBILE2's array requirements by 3,358 memory words.

2. Eliminate I/M credits. Users who do not need to include I/M effects in their analyses can eliminate BLOCK DATA 6 and its common area, COMMON/IMCRED/ (9,500 integer values). Routines PCLEFT and NEWDAT could also be eliminated.

   A less drastic reduction can be made by eliminating unneeded portions of the I/M credit arrays.

3. Any other useless arrays, or portions thereof, could be eliminated.

4. Use halfword integer arrays. All the integer arrays in COMMON areas are fullword integers. This is because halfword integers, or INTEGER*2, are not an ANSI FORTRAN standard, and we wanted MOBILE2 to be compatible with as many systems as possible. These integer arrays contain over 13,500 words of either 2-digit I/M credits or 4-digit model years. If the user has the halfword option available, and if the user's word length is such that a halfword can store a 4-digit integer, then changing the integer arrays from fullwords to halfwords can recoup nearly 7,000 words of memory.

Users who wish to reduce MOBILE2's run time can do so in the following manners:

1. To reduce the overhead associated with subroutine calls, routines which are called from only one or two places could be deleted and their logic moved in-line into the calling routine. This is particularly true of the pointer functions, which typically contain very few lines of code. Examples are:

   (a) The logic of INDX3A could be moved into routines EFCALX and EFALTX.

   (b) CCEVRT could contain the logic of HOTSOK, CRANKC, DIURNL, XMPD, and TPD.

   (c) BEF and BEFIDL could be placed in-line in EFCALX

   (d) BEF could check for the necessity of calling PCLEFT. (check IMFLG, etc.).

   (e) IGLPTR, IGTPTR, IGEPTR, IGUPTR could be placed in ALUH.

   (f) ISPPTR, ISPPTB, IGPPTR could be coded in BIGCFX.

2. Any or all multi-dimensional arrays may be converted to single dimension arrays in the executable code (not necessarily in the block data subprograms). For any converted array, the user must then compute the required subscript to extract the correct data value. This method gains little, if any, run time when the available FORTRAN compiler globally optimizes code.

3. If the user typically runs MOBILE2 with the PRTFLG value greater than zero (to select only one pollutant to output), then the computational logic could be changed to evaluate only the selected pollutant. It currently evaluates all pollutants. Approximately 15-20% of the total run time is expended to evaluate one pollutant.

4. Computational code may be converted to assembly language mnemonics with an extended FORTRAN which permits an in-line assembly drop-in to be interspersed with the ordinary FORTRAN statements. Depending on the optimizing capabilities of the available FORTRAN compiler, this method can reduce the run time by 10% to 50%.

5. The user could tailor the program to their specific usage. Unneeded options could be eliminated. Input and output could be modified. The consideration of hard-coding locality specific data has already been mentioned.

5.9 PROGRAM UPDATE INFORMATION

EPA expects MOBILE2 to undergo future revision to correct any possible errors, improve program performance, and incorporate changes in the methodology. Users who wish to submit changes or corrections can mail these to the EPA Motor Vehicle Emission Laboratory in Ann Arbor at the address given at the end of this section.

A list of program errors and User Guide corrections will be compiled and periodically distributed to EPA Regional offices. We do not currently intend to support a user mailing list for automatic distribution of these corrections. Users should contact their regional offices from time to time. Users, who wish to do so, may submit the following Update Request form. In the event that a mailing list is assembled, they will be included and sent any published changes to MOBILE2.

MOBILE2 UPDATE REQUEST

Mail to:

Office of Mobile Source Air Pollution Control
Emission Control Technology Division
Test and Evaluation Branch
2565 Plymouth Road
Ann Arbor, Michigan 48105
Attention: MOBILE2

Name and Address of User:

____

____

____

____

CITY ________________________ STATE __________

ZIP ______________________________________

Name and telephone numbers of individual(s) we may need to reach to respond to questions:

____

____

____

____

____

MOBILE2-1

A.0 INTRODUCTION

This appendix describes standard MOBILE2 variable names, MOBILE2 program common, MOBILE2 software modules (main program, subroutines, function subprograms, and block data subprograms), and a MOBILE2 structure chart.

Variables and arrays are described in detail. This appendix describes the name, type, dimension, format, and description of variables and arrays. In addition, subprogram arguments are identified as inputs or outputs of the function or subroutine. Variable and array data types are indicated as I for integer and R for real. The format of the information stored in the variable or array is indicated to be I for integral, R for real (floating point), and A (A1 or A4) for character. This appendix also describes the relationship of variables and arrays that occupy equivalent memory, along with the logical meaning of array subscripts.

A.1 STANDARD VARIABLE NAMES

Standard names have been adopted for several MOBILE2 variables. Whenever MOBILE2 software or documentation uses a standard name, users should refer to the explanation below for a description of the variable.

VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IV	I	--	I	An integer variable used as a vehicle type code/index. Codes used are as follows: 1 = LDGV = Light duty gasoline powered vehicle. 2 = LDGT1 = Light duty gasoline powered truck 1. 3 = LDGT2 = Light duty gasoline powered truck 2. 4 = HDGV = Heavy duty gasoline powered vehicle. 5 = LDDV = Light duty diesel powered vehicle. 6 = LDDT = Light duty diesel powered truck. 7 = HDDV = Heavy duty diesel powered vehicle. 8 = MC = Motorcycle. 9 = LDGT = Combined light duty gasoline powered trucks.

IP	I	--	I	An integer variable used as a pollutant index/code. Codes used are as follows: 1 = hydrocarbon (HC). 2 = carbon monoxide (CO). 3 = oxides of nitrogen (NOx).
IR	I	--	I	An integer variable used as a region index/code. Codes used are as follows: 1 = Low altitude 49-State. 2 = Low altitude California. 3 = High altitude 49-State.
ICY	I	--	I	An integer variable that contains the value of the calendar year.
MY	I	--	I	An integer variable that contains the value of the model year.
IDX	I	--	I	An integer variable that contains the value of 20 plus the model year (MY) minus the calendar year (ICY). IDX increases in the same direction as model year. IDX is used as a model year index. IDX has a value of 20 when the model year equals the calendar year.
JDX	I	--	I	An integer variable that contains the value of the calendar year (ICY) minus the model year (MY) plus 1. JDX has a value of 1 when the model year equals the calendar year, 2 when the model year equals the calendar year minus 1, and so on. JDX = 21 - IDX . JDX increases in the same direction as vehicle age.
IG	I	--	I	An integer variable that contains a model year group subscript. This document uses IG in several places as a generic variable to illustrate correspondence between group subscripts in data arrays and their associated index arrays.

Group subscripts may have different values in unrelated arrays even though both arrays are documented by means of IG.

Coefficient arrays are organized into "groups" to conserve memory. Coefficient arrays are usually functions of model year. Most coefficient values are used for more than one year. It is often economical to store each value once and create a secondary index that defines the "group" of valid years that apply to a coefficient. The index array is used to determine the group subscript of the coefficient array.

STANDARD VARIABLE NAMES

A.2 PROGRAM COMMON DESCRIPTION

Limitations of time and manpower made it impossible to specify and initialize individual array elements in data statements. MOBILE2 initializes most arrays by means of "implied do-loops". Because many FORTRAN implementations restrict the number of continuation lines in one statement, many MOBILE2 arrays are too large to be initialized from a single data statement. Equivalent arrays are defined to support data initialization. Each equivalent array corresponds to a logical subdivision of a major array and is small enough to be initialized by means of a single data statement. We believe that this approach will produce code that is easy to comprehend and maintain.

STANDARD VARIABLE NAMES

COMMON NAME: ACOM

DESCRIPTION: Common area used to store speed correction factor coefficients for motorcycles and light duty gasoline powered vehicles and trucks. Group subscript IG is identical to the model year group subscripts determined by functions IG = ISPPT8(MY,IR,IP) for motorcycles and IG = ISPPTR(MY,IR,IVG) for the other vehicle types.

FORTRAN DEFINITION:

```
COMMON/ACOM/AIN1,AIN2,AIN3
            or
COMMON/ACOM/AIN
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
AIN(I,IG,IP)	R	6*18*3	R	Speed correction factor coefficients. Alternative names for AIN are AIN1, AIN2, and AIN3. The first subscript I refers to the coefficients of the 6 terms of the 5th degree polynomial that determines the speed correction factor.
AIN1(I,IG)	R	6*18	R	Hydrocarbon speed correction factor coefficients. Array element AIN1(I,IG) occupies memory equivalent to AIN(I,IG,1). Arrays A11 and A12, equivalent to AIN1, are used to initialize AIN1 in a block data subprogram.
AIN2(I,IG)	R	6*18	R	Carbon monoxide speed correction factor coefficients. Array element AIN2(I,IG) occupies memory equivalent to AIN(I,IG,2). Arrays A21 and A22, equivalent to AIN2, are used to initialize AIN2 in a block data subprogram.
AIN3(I,IG)				

R	6*18	R	Oxides of nitrogen speed correction factor coefficients. Array element AIN3(I,IG) occupies memory equivalent to AIN(I,IG,3). Arrays A31 and A32, equivalent to AIN3, are used to initialize AIN3 in a block data subprogram.

COMMON ACOM

COMMON NAME: ALTCOM

DESCRIPTION: Common area used to store modified basic exhaust emission rates.

FORTRAN DEFINITION:

```
COMMON/ALTCOM/INTALT,R4ALT,MODFLG,NEWFAC
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
INTALT(5,N)	I	5*100	I	The first subscript refers to the region, vehicle type, pollutant, first model year, and last model year; respectively, for each basic exhaust emission rate to be modified. The second subscript is a counter to allow up to 100 modified basic exhaust emission rates to be entered.
R4ALT(2,N)	R	2*100	R	The first subscript refers to the zero mile emission level and emission deterioration rate, respectively, of each basic exhaust emission rate that is entered.
MODFLG(N)	I	100	I	Flag which indicates whether the modified basic emission rate was used or not.
NEWFAC	I	--	I	Number of zero mile level and emission deterioration rate pairs to be entered.

COMMON NAME: ALTEQU

DESCRIPTION: A common area used to store the maximum number of emission equations for each region, pollutant, and vehicle-type combination.

FORTRAN DEFINITION:

```
COMMON/ALTEQU/MAXEQU
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
MAXEQU	I	--	I	A variable that contains the maximum number of basic exhaust and idle emission rates (model year groups) for each vehicle type/region/pollutant combination. The value stored in this variable equals the dimension of the first subscript of arrays BASE3R, DEL3R, IDLB3R, IDEL3R, and INDXYR. In MOBILE2, MAXEQU contains the value of 15.

COMMON NAME: ALUCOM, ALUPTR

DESCRIPTION: Common ALUPTR is used in subroutine ALUH by functions IGEPTR, IGUPTR, IGLPTR, and IGTPTR to calculate group subscripts into arrays in common ALUCOM. Group subscripts are determined by the functions as follows:

```
IGE = IGEPTR(MY,IVP,IR)
IGU = IGUPTR(MY,IVP,IR)
IGL = IGLPTR(MY,IVP,IR)
IGT = IGTPTR(MY,IVP,IR)
```

FORTRAN DEFINITION:

```
COMMON/ALUCOM/ACEQIP,ACCF,XLCF,TWCF
COMMON/ALUPTR/IGEYRS,IGUYRS,IGLYRS,IGTYRS
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
ACEQIP(IGE,IVP,IR)	R	8*3*3	R	An array used to store the fraction of light duty gasoline powered vehicles or trucks equipped with air conditioning. The first subscript corresponds to the model year group. The second corresponds to the vehicle type (1=LDGV, 2=LDGT1, 3=LDGT2). The third corresponds to the three regions.
ACCF(I,IP,IGU,IVP,IR)	R	2*3*2*3*3	R	An array used to store air conditioning correction factor coefficients. The first subscript refers to the coefficients of the 2 terms of the linear equation that determines the correction factor.
XLCF(IP,IGL,IVP,IR)	R	3*6*3*3	R	An array used to store extra load correction factor coefficients.
TWCF(IP,IGT,IVP,IR)	R	3*6*3*3	R	An array used to store trailer towing correction factor

				coefficients.
IGEYRS(IGE,IVP,IR)	I	8*3*3	I	An integer array that contains the last model year for each coefficient group in ACEQIP.
IGUYRS(IGU,IVP,IR)	I	2*3*3	I	An integer array that contains the last model year for each coefficient group in ACCF.
IGLYRS(IGL,IVP,IR)	I	6*3*3	I	An integer array that contains the last model year for each coefficient group in XLCF.
IGTYRS(IGT,IVP,IR)	I	6*3*3	I	An integer array that contains the last model year for each coefficient group in TWCF.

COMMON ALUCOM, ALUPTR

COMMON NAME: BASECM

DESCRIPTION: Common area used to store the basic exhaust zero mile emission levels (grams/mile). Function INDX3R can be used to obtain the group subscript IG = INDX3R(MY,IP,IV,IR) for array BASECM.

FORTRAN DEFINITION:

```
COMMON/BASECM/BASE49,BASECA,BASEHI
          or
COMMON/BASECM/BASE3R
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
BASE3R(IG,IP,IV,IR)	R	15*3*8*3	R	Basic exhaust zero mile emission levels.
BASE49(IG,IP,IV)	R	15*3*8	R	An array used to store basic exhaust zero mile emission levels for the Low altitude 49-State region. Array element BASE49(IG,IP,IV) occupies memory equivalent to BASE3R(IG,IP,IV,1). Arrays B41 and B42, equivalent to BASE49, are used to initialize BASE49 in a block data subprogram.
BASECA(IG,IP,IV)	R	15*3*8	R	An array used to store basic exhaust zero mile emission levels for the Low altitude California region. Array element BASECA(IG,IP,IV) occupies memory equivalent to BASE3R(IG,IP,IV,2). Arrays BC1 and BC2, equivalent to BASECA, are used to initialize BASECA in a block data subprogram.
BASEHI(IG,IP,IV)	R	15*3*8	R	An array used to store basic exhaust zero mile emission

levels for the High altitude 49-State region. Array element BASEHI(IG,IP,IV) occupies memory equivalent to BASE3R(IG,IP,IV,3). Arrays BH1 and BH2, equivalent to BASEHI, are used to initialize BASEHI in a block data subprogram.

COMMON NAME: BEFGCM

DESCRIPTION: Common area used to store the fractional contribution of non-methane hydrocarbon to the total hydrocarbon basic and idle emission rates.

FORTRAN DEFINITION:

```
COMMON/BEFGCM/EXMETH,IEXMYR
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
EXMETH(IG,IV,IR)	R	3*8*3	R	An array used to store the fractional contribution of non-methane hydrocarbon to the total hydrocarbon basic and idle emission rates.
IEXMYR(IG,IV,IR)	I	3*8*3	I	An array used to store the last model year of each EXMETH coefficient group.

COMMON NAME: CEVCOM

DESCRIPTION: Common area used to store user supplied trips per day and miles per day.

FORTRAN DEFINITION:

```
COMMON/CEVCOM/USRTPD,USRMPD
```

VARIABLES AND ARRAYS

NAME	TYPE	DIM	FMT	DESCRIPTION
USRTPD(IV)	R	8	R	User supplied trips per day.
USRMPD(IV)	R	8	R	User supplied miles per day.

COMMON NAME: CUMCOM

DESCRIPTION: Common area used to store cumulative vehicle mileage for twenty model years up to and including the calendar year.

FORTRAN DEFINITION:

```
COMMON/CUMCOM/CUMMIL
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
CUMMIL(JDX,IV)	R	20*8	R	A real array used to store cumulative vehicle mileage (in miles) for twenty model years up to and including the calendar year.

COMMON NAME: DELCOM

DESCRIPTION: Common area used to store the basic exhaust emission deterioration rates (grams/mile/10,000 miles). Function INDX3R can be used to determine the group subscript IG = INDX3R(MY,IP,IV,IR) for array DELCOM.

FORTRAN DEFINITION:

```
COMMON/DELCOM/DEL49,DELCA,DELHI
              or
COMMON/DELCOM/DEL3R
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
DEL3R(IG,IP,IV,IR)	R	15*3*8*3	R	Basic exhaust emission deterioration rates.
DEL49(IG,IP,IV)	R	15*3*8	R	An array used to store the basic exhaust emission deterioration rates for the Low altitude 49-State region. Array element DEL49(IG,IP,IV) occupies memory equivalent to DEL3R(IG,IP,IV,1). Arrays D41 and D42, equivalent to DEL49, are used to initialize DEL49 in a block data subprogram.
DELCA(IG,IP,IV)	R	15*3*8	R	An array used to store the basic exhaust emission deterioration rates for the Low altitude California region. Array element DELCA(IG,IP,IV) occupies memory equivalent to DEL3R(IG,IP,IV,2). Arrays DC1 and DC2, equivalent to DELCA, are used to initialize DELCA in a block data subprogram.
DELHI(IG,IP,IV)	R	15*3*8	R	An array used to store the basic exhaust emission deterioration

rates for the High altitude 49-State region. Array element DELHI(IG,IP,IV) occupies memory equivalent to DEL3R(IG,IP,IV,3). Arrays DH1 and DH2, equivalent to DELHI, are used to initialize DELHI in a block data subprogram.

COMMON DELCOM

COMMON NAME: FLGCOM

DESCRIPTION: Common area FLGCOM contains input/output flags.

FORTRAN DEFINITION:

```
COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG,
MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
ALTFLG	I	--	I	Controls the modification of the basic exhaust emission rates.
VMFLAG	I	--	I	Selects optional use of user supplied VMT mix among vehicle types.
ALHFLG	I	--	I	Flags optional use of correction factors for air conditioning, extra loading, trailer towing, and NOx humidity.
IRDFLG	I	--	I	Flag set to 0 when all data has been input or an end-of-file reached.
SPDFLG	I	--	I	Selects use of the different average vehicle speed options.
NMHFLG	I	--	I	Selects the calculations of total or non-methane HC emission factors.
IDLFLG	I	--	I	Flags optional output of idle emission factors.
MYMRFG	I	--	I	Flags optional user supplied registration and/or mileage accrual data.
IMFLG	I	--	I	Flags optional existence of inspection/maintenance program.
ICEVFG	I	--	I	Controls optional listing of crankcase and evaporative HC emission factors and/or input of

				user supplied trips per day and miles per day data.
PRTFLG	I	--	I	Select the pollutant results to be output.
IFORM	I	--	I	Flags output report format.
MDEFLG	I		I	Flags "vertical" or "horizontal" input of other flag values.

COMMON NAME: GPCCOM

DESCRIPTION Common area used to store RIPSTWXN bag term coefficients. Array GPACOF contains the Bipb and Dipb AP-42 RIPSTWXN normalization coefficients. Array GPBCOF contains speed correction factor coefficients for heavy duty and diesel powered vehicles. The model year group subscripts IG are determined by using function IG = IGPPTR(MY,IP,IREJN,IV). The vehicle type subscript IVG is stored in array element IVPTRG(IV) in common IVPCOM. The first subscripts of GPACOF (IC1) and GPBCOF (IC2) have the following correspondence with AP-42:

IC1	AP-42 Coefficient
1	Bip1
2	Dip1
3	Bip2
4	Dip2
5	Bip3
6	Dip3
7	Bip0
8	Dip0

IC2	AP-42 Coefficient
1	A
2	B
3	C

FORTRAN DEFINITIONS

```
COMMON/GPCCOM/GPACOF,GPBCOF
```

VARIABLES AND ARRAYS

NAME	TYPE	DIM	FMT	DESCRIPTION
GPACOF(IC1,IG,IP,IVG)	R	8*9*3*6	R	A real array used to store RIPSTWXN normalization coefficients for vehicles selected by IVG.
GPBCOF(IC2,IG,IP,IVB)	R	3*3*3*4	R	A real array used to store speed correction factors for vehicles

selected by IVB.

Equivalent arrays are used to initialize GPACOF and GPBCOF in block data subprograms. The last character of the name of the array used to initialize GPACOF refers to the pollutant number ("1" - "3") and the second to the last digit refers to the vehicle type number. Thus, GPAC23 defines data for vehicle type 2 (LDGT1) and pollutant 3 (NOx). The last character of arrays used to initialize GPBCOF refers to the vehicle number. Thus, GPBC06 initializes data for vehicle type 6 (LDDT).

COMMON GPCCOM

COMMON NAME: GSFCOM

DESCRIPTION Common area used to store the diesel or gasoline sales fraction of each vehicle type by model year. The group subscript, IG, of array GSF can be determined by using function IG = IGSFPT(MY,IV,IR).

FORTRAN DEFINITIONS

```
COMMON/GSFCOM/MAXGSF,GSF,IGSFYR
```

VARIABLES AND ARRAYS

NAME	TYPE	DIM	FMT	DESCRIPTION
MAXGSF	I	--	I	An integer variable that contains the dimension of group subscript IG in arrays GSF and IGSFYR.
GSF(IG,IV,IR)	R	18*8*3	R	A real array used to store the diesel or gasoline sales fraction of each vehicle type by model year.
IGSFYR(IG,IV,IR)	R	18*8*3	R	An integer array used to store the last model year of each model year group in array GSF.

COMMON NAME: HOTCOM,TPDCOM,DIUCOM,XMPCOM,CRACOM

DESCRIPTION: Common areas used to store crankcase and evaporative HC emission data. These common areas are used with functions HOTSOK, TPD, DIURNL, XMPD, and CRANKC to replace common area CEVCOM from the original MOBILE1 program. All of these common areas have a similar structure. The beginning of the common area contains a variable that stores the maximum number of model year groups in common data and index arrays. Following this is a data array, and last an index array. The data and index arrays hava a similar structure. The first subscript of each array is a group subscript (IG), the second is a vehicle type subscript (IV), and the third is a region subscript (IR). For a particular model year, vehicle type, and region, the group subscript IG is the minimum value of IG that satisfies the following relation:

MODEL YEAR ≤ INDEX ARRAY(IG,IV,IR).

The group subscript dimension of each array is stored in the associated variable with a name that begins with "MAX". For a given model year, vehicle type, and region; the five functions HOTSOK, TPD, DIURNL, XMPD, and CRANKC use an index array to locate the corresponding value in a data array, which is then returned to the calling program.

The following table lists variables and arrays in each common area, plus array dimensions:

COMMON	NO.GROUPS	DATA ARRAY	INDEX ARRAY
HOTCOM	MAXHOT	HOTVAL(6,8,3)	IHOTYS(6,8,3)
TPDCOM	MAXTPD	TPDVAL(2,8,3)	ITPDYS(2,8,3)
DIUCOM	MAXDIU	DIUVAL(6,8,3)	IDIUYS(6,8,3)
XMPCOM	MAXXMP	XMPVAL(2,8,3)	IXMPYS(2,8,3)
CRACOM	MAXCRA	CRAVAL(3,8,3)	ICRAYS(3,8,3)

The variables that contain the number of groups are integer, data arrays are real, and index arrays are integer. All index arrays contain four-digit model years that define the latest valid year for a group.

Array HOTVAL contains hot soak HC emission data (gm/trip), TPDVAL contains trips per day, DIUVAL contains diurnal HC emission data (gm/day), XMPVAL contains miles per day, and CRAVAL contains crankcase HC emission data (gm/mi).

Each of these arrays is initialized in a block data subprogram.

FORTRAN DEFINITION:

```
COMMON/HOTCOM/MAXHOT,HOTVAL,IHOTYS
COMMON/TPDCOM/MAXTPD,TPDVAL,ITPDYS
COMMON/DIUCOM/MAXDIU,DIUVAL,IDIUYS
COMMON/XMPCOM/MAXXMP,XMPVAL,IXMPYS
COMMON/CRACOM/MAXCRA,CRAVAL,ICRAYS
```

COMMON NAME: IDLBCM

DESCRIPTION: Common area used to store the zero mile idle emission levels (grams/minute). Function INDX3R can be used to determine group subscripts IG=INDX3R(MY,IV,IP,IR) for array IDLB3R.

FORTRAN DEFINITION:

```
COMMON/IDLBCM/IDLB49,IDLBCA,IDLBHI
          or
COMMON/IDLBCM/IDLB3R
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
IDLB3R(IG,IP,IV,IR)	R	15*3*8*3	R	The zero mile idle emission levels. Equivalent names for IDLB3R are IDLB49, IDLBCA, and IDLBHI.
IDLB49(IG,IP,IV)	R	15*3*8	R	An array used to store the zero mile idle emission levels for the Low altitude 49-State region. Array element IDLB49(IG,IP,IV) occupies memory equivalent to IDLB3R(IG,IP,IV,1). Arrays IB41 and IB42, equivalent to IDLB49, are used to initialize IDLB49 in a block data subprogram.
IDLBCA(IG,IP,IV)	R	15*3*8	R	An array used to store the zero mile idle emission levels for the Low altitude California region. Array element IDLBCA(IG,IP,IV) occupies memory equivalent to IDLB3R(IG,IP,IV,2). Arrays IBC1 and IBC2, equivalent to IDLBCA, are used to initialize IDLBCA in a block data subprogram.
IDLBHI(IG,IP,IV)	R	15*3*8	R	An array used to store the zero

mile idle emission levels for the High altitude 49-State region. Array element IDLBHI(IG,IP,IV) occupies memory equivalent to IDLB3R(IG,IP,IV,3). Arrays IBH1 and IBH2, equivalent to IDLBHI, are used to initialize IDLBHI in a block data subprogram.

COMMON NAME: IDLDCM

DESCRIPTION: Common area used to store idle emission deterioration rates (grams/minute/10,000 miles). Function INDX3R can be used to determine group subscripts IG = INDX3R(MY,IV,IP,IR) for array IDEL3R.

FORTRAN DEFINITION:

```
COMMON/IDLDCM/IDEL49,IDELCA,IDELHI
          or
COMMON/IDLDCM/IDEL3R
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
IDEL3R(IG,IP,IV,IR)	R	15*3*8*3	R	Idle emission deterioration rates. Equivalent names for IDEL3R are IDEL49, IDELCA, and IDELHI.
IDEL49(IG,IP,IV)	R	15*3*8	R	An array used to store idle emission deterioration rates for the Low altitude 49-State region. Array element IDEL49(IG,IP,IV) occupies memory equivalent to IDEL3R(IG,IP,IV,1). Arrays IL41 and IL42, equivalent to IDEL49, are used to initialize IDEL49 in a block data subprogram.
IDELCA(IG,IP,IV)	R	15*3*8	R	An array used to store idle emission deterioration rates for the Low altitude California region. Array element IDELCA(IG,IP,IV) occupies memory equivalent to IDEL3R(IG,IP,IV,2). Arrays ILC1 and ILC2, equivalent to IDELCA, are used to initialize IDELCA in a block data subprogram.
IDELHI(IG,IP,IV)	R	15*3*8	R	An array used to store idle

emission deterioration rates for the High altitude 49-State region. Array element IDELHI(IG,IP,IV) occupies memory equivalent to IDEL3R(IG,IP,IV,3). Arrays ILH1 and ILH2, equivalent to IDELHI, are used to initialize IDELHI in a block data subprogram.

COMMON NAME: IMCOM

DESCRIPTION: Common area used to store inspection/maintenance information.

FORTRAN DEFINITION:

```
COMMON/IMCOM/ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2,ILDT,IOPTN,NUDATA
NLINES,STRING
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
ICYIM	I	--	I	Calendar year that I/M begins ($1970 \leq ICYIM \leq 2020$).
ISTRIN	I	--	I	(Also ISTRN) - Stringency of I/M program for Technology I and II ($10 \leq ISTRIN \leq 50$).
IMTFLG	I	--	I	Mechanic training flag (0 = no, 1 = yes).
MODYR1	I	--	I	Earliest model year included in the I/M program.
MODYR2	I	--	I	Latest model year included in the I/M program.
ILDT	I	--	I	Vehicle types to be affected by the I/M program.
IOPTN	I	--	I	Optional identification rate for Technology IV vehicles (50 thru 90).
NUDATA	I	--	I	New I/M credit data flag (0 thru 3).
NLINES	I	--	I	Number of descriptive text lines associated with the new data (0 thru 9).
STRING(18,9)	R	18*9	18A4	I/M descriptive text lines (0 thru 9 lines of text, 0 thru 72 characters per line).

COMMON NAME: IMCRED

DESCRIPTION: Common area used to store percent emission reductions due to an I/M program (credits).

FORTRAN DEFINITION:

```
COMMON/IMCRED/IRED,ITECH4
```

VARIABLES AND ARRAYS:

```
    NAME     TYPE DIM      FMT      DESCRIPTION

    IRED(BY,AGE1ST,ISTRIN,ITECH,IP)
               I    (19,20 5,2,2)
                             I      Percent reduction of  emissions
                                    for Technology I and II vehicles
                                    due to an I/M program.

    ITECH4(BY,AGE1ST,IOPTN)
               I    (19,20,5)
                             I      Percent  reduction  of emissions
                                    for Technology IV  vehicles  due
                                    to an I/M program.
```

COMMON NAME: INDXCM

DESCRIPTION: Common area used to store the first and last model years for emission rate equation model year groups. This common is used by function INDX3R to calculate group indices into coefficient arrays BASE3R (common BASECM), DEL3R (common DELCOM), IDLB3R (common IDLBCM), and IDEL3R (common IDLDCM). The first subscript in each emission rate coefficient array is a group subscript that is valid for a model year time interval (group) MY1...MY...MY2. Likewise, the leftmost subscript of array INDXYR is a group subscript. The group subscript of INDXYR is the same as the coefficient array group subscript.

The second subscript of INDXYR, IFL, is given a value of one to access the first model year in a group and a value of two to access the last. Function INDX3R returns the group subscript INDX3R = IG, such that INDXYR(IG,1,IP,IV,IR) ≤ MODEL YEAR ≤ INDXYR(IG,2,IP,IV,IR).

FORTRAN DEFINITION:

```
COMMON/INDXCM/INDX49,INDXCA,INDXHI
              or
COMMON/INDXCM/INDXYR
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
INDXYR(IG,IFL,IP,IV,IR)	I	15*2*3*8*3	I	An array used to store the first and last model years for emission rate equation model year groups. Equivalent names for INDXYR are INDX49, INDXCA, and INDXHI.
INDX49(IG,IFL,IP,IV)	I	15*2*3*8	I	An array used to store the first and last model years for each Low altitude 49-State emission rate equation model year group. Array element INDX49(IG,IFL,IP,IV) occupies memory equivalent to INDXYR(IG,IFL,IP,IV,1).

INDXCA(IG,IFL,IP,IV)
I 15*2*3*8
I

An array used to store the first and last model years for each Low altitude California emission rate equation model year group. Array element INDXCA(IG,IFL,IP,IV) occupies memory equivalent to INDXYR(IG,IFL,IP,IV,2).

INDXHI(IG,IFL,IP,IV)
I 15*2*3*8
I

An array used to store the first and last model years for each High altitude 49-State emission rate equation model year group. Array element INDXHI(IG,IP,IV) occupies memory equivalent to INDXYR(IG,IFL,IP,IV,3).

Equivalent arrays are used to initialize these arrays in a block data subprogram. The names of the equivalent arrays are constructed by deleting the third and fourth characters of "INDX49", "INDXCA", and "INDXHI", appending the letter "V", and adding a numeric character that corresponds to the vehicle type. Thus, "INCAV7" initializes the array used to store California region data for vehicle type 7 (HDDV).

COMMON NAME: IOUCOM

DESCRIPTION: Common area used to store FORTRAN unit numbers for all input and output files.

FORTRAN DEFINITIONS:

```
COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
IOUIMD	I	--	I	Input unit number for new I/M credit data. Initialized to 4.
IOUGEN	I	--	I	Input unit number for general data. Initialized to 5.
IOUREP	I	--	I	Output unit number for formatted reports. Initialized to 6.
IOUERR	I	--	I	Output unit number for diagnostic messages. Initialized to 6.
IOUASK	I	--	I	Output unit number for prompting messages. Initialized to 6.
IOUUNF	I	--	I	Output unit number for unformatted reports. Initialized to 9. Unformatted output logic is not supplied with MOBILE2.

COMMON NAME: ISPCOM

DESCRIPTION: Common area used to store a table of years for use by function ISPPTR to determine a group subscript. ISPYR8 is a table of years used by function ISPPT8 to determine a group subscript. The subscript is used to index variable SPBACK in subroutine BIGCFX.

FORTRAN DEFINITIONS:

```
COMMON/ISPCOM/ISPYRS,ISPYR8.
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
ISPYRS(IG,IR,IVG)	I	18*3*3	I	An integer array that contains the last model year of light duty speed correction factor groups.
ISPYR8(IG,IR,IP)	I	18*3*3	I	An integer array that contains the last model year for motorcycle speed correction factor groups.

Equivalent arrays are used to initialize ISPYRS in a block data subprogram. The names of equivalent arrays are constructed by dropping the letter "S" from "ISPYRS" and replacing it with the vehicle type number. Thus, ISPYR1 initializes data for vehicle type 1 (LDGV).

COMMON NAME: IVPCOM

DESCRIPTION: Common area used to store vehicle group subscripts. Array IVPTRG stores vehicle group subscripts for array GPACOF in common GPCCOM and array ISPYRS in common ISPCOM. Array IVPTRT stores vehicle group subscripts for array TTACOF in common TCFCOM. Array IVPTRB stores vehicle group subscripts for array GPBCOF in common GPCCOM. IVPTRA stores vehicle group subscripts for array ALHRET in common RET1.

FORTRAN DEFINITION:

```
COMMON/IVPCOM/IVPTRG,IVPTRT,IVPTRA,IVPTRB
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
IVPTRG(IV)	I	8	I	An integer array that contains vehicle group subscript IVG.
IVPTRT(IV)	I	8	I	An integer array that contains vehicle group subscript IVT.
IVPTRA(IV)	I	8	I	An integer array that contains the vehicle group subscript IVA.
IVPTRB(IV)	I	8	I	An integer array that contains the vehicle group subscript IVB.

COMMON NAME: LNKCOM

DESCRIPTION: Common area LNKCOM is used to store physical factors affecting emissions.

FORTRAN DEFINITION:

```
COMMON/LNKCOM/SPD,TAMB,PCCN,PCHC,PCCC
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
SPD(IV)	R	8	R	Individual vehicle type, average speeds ($5 \leq SPD \leq 55$).
TAMB	R	--	R	Ambient temperature (DEG F) (0 DEG ≤ TEMP ≤ 110 DEG).
PCCN	R	--	R	Percent non-catalyst equipped vehicle miles travelled accumulated in cold start mode.
PCHC	R	--	R	Percent catalyst equipped vehicle miles travelled accumulated in hot start mode.
PCCC	R	--	R	Percent catalyst equipped vehicle miles travelled accumulated in cold start mode.

COMMON NAME: MYMCOM

DESCRIPTION: Common area used to store mileage, registration, and travel factors after correction to January 1.

FORTRAN DEFINITION:

```
COMMON/MYMCOM/XMYM,XMYR,TF,TFMYM
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
XMYM(IDX,IV)	R	20*8	R	(Also MYMDUM) - A real array used to store the annual mileage/100,000 distributions.
XMYR(IDX,IV)	R	20*8	R	A real array used to store the estimated current-year January 1 registration distributions.
TF(DX,IV)	R	20*8	R	A real array used to store the travel fraction (TF) distributions. Subscript DX is identical to standard variable IDX everywhere except in subroutine TFCALX, where, for historical reasons, it corresponds to JDX.
TFMYM(IDX,IV)	R	20*8	R	A real array used to store the January 1 model year mileage accumulation rates.

COMMON NAME: MYMSAV

DESCRIPTION: Common area used to store vehicle mileage accumulation and registration distributions.

FORTRAN DEFINITION:

```
COMMON/MYMSAV/SAVMYM,SAVMYR
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
SAVMYM(JDX,IV)	R	20*8	R	A real array used to store the annual mileage/100,000 distributions.
SAVMYR(JDX,IV)	R	20*8	R	A real array used to store the July 1 registration distributions.

COMMON NAME: PROJCM

DESCRIPTION: Common area to store the project title.

FORTRAN DEFINITION:

```
COMMON/PROJCM/PROJID
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
PROJID(20)	R	20	20A4	Project title.

COMMON NAME: PTRCOM

DESCRIPTION: Common area used to store the last model year for low/hi temperature correction factor and RIPSTWAN bag term coefficient groups. The common is used by function IGPPTR to calculate group subscripts for arrays TTACOF and TT4COF in common area TCFCOM and arrays GPACOF and GPBCOF in common area GPCCOM. The group subscript in array IGPYRS equals the group subscript in the coefficient array.

FORTRAN DEFINITION:

```
COMMON/PTRCOM/WAXIGP,IGPYRS
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
WAXIGP	I	--	I	An integer that contains the dimension of group subscript IG in array IGPYRS.
IGPYRS(IG,IP,IR,IV)	I	9*2*3*8	I	Integer array used to store the last model year of low/hi temperature correction factor and RIPSTWAN bag term coefficient groups.

Equivalent arrays are used to initialize IGPYRS in a block data subprogram. The names of the equivalent arrays are constructed by replacing the letter "S" in "IGPYRS" with the vehicle number. Thus, IGPYR8 defines the data for vehicle type 8 (motorcycles).

COMMON NAME: REGCOM

DESCRIPTION: Common area used to store a region code for the region under consideration.

FORTRAN DEFINITION:

```
COMMON/REGCOM/IREJN,ALT
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
IREJN	I	--	I	An integer used to store a code that identifies the region under consideration. Valid codes are as follows: 1 = Low altitude 49-State 2 = Low altitude California 3 = High altitude 49-State
ALT	R	--	R	A real variable used to store a value of altitude. The default value assigned by the program for Low altitude 49-State and California is 500 feet. The program assigns a value of 5500 feet for High altitude 49-State.

COMMON NAME: REGSUM

DESCRIPTION: Common area used to store the registration fractions for the light duty vehicle and light duty truck (excluding LDGT2) fleets; accounting for gasoline and diesel sales and changing from July to January registrations.

FORTRAN DEFINITION:

COMMON/REGSUM/SUM1

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
SUM1(IV)	R	8	R	For IV = 3,4,7 and 8, SUM1(IV) equals 1. For IV = 1, SUM1(IV) equals the LDGV fraction of the LDV fleet registration in the evaluation calendar year. For IV = 5, SUM1(IV) equals the LDDV fraction of the same fleet. For IV = 2 and 6, SUM1(IV) equals the LDGT1 and LDDT fractions of the LDT fleet (excluding LDGT2).

COMMON NAME: RET1

DESCRIPTION: Common area used to store an overall correction factor accounting for air conditioning, extra load, trailer towing, and humidity for NOx; for LDGV, LDGT1, LDGT2, and MC.

FORTRAN DEFINITION:

```
COMMON/RET1/ALHRET
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
ALHRET(IDX,IVA,IP)	R	20*4*3	R	An overall correction factor accounting for air conditioning, extra load, trailer towing, and humidity for NOx.

COMMON NAME: SYSCOM

DESCRIPTION: Common area used to store system limits.

FORTRAN DEFINITION:

```
COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
MAXVEH	I	--	I	Number of different vehicle types supported by the program. Initialized to 8.
MAXLTW	I	--	I	Maximum number of light duty vehicles used in ALUH, excluding motorcycles. Initialized to 3.
MAXPOL	I	--	I	Number of pollutants. Initialized to 3.
MAXREG	I	--	I	Number of regions. Initialized to 3.
INITPR	I	--	I	Printout initialization indicator.

COMMON NAME: TCFCOM

DESCRIPTION: Common area used to store low/hi temperature correction factor coefficients. In the documentation below, IB represents test sequence 1 to 3, IG is a model year group subscript determined by using function IG = IGPPTR(MY,IP,IREJN,IV), and IVT is a vehicle group subscript stored in array IVPTRT(IV) in common IVPCOM.

FORTRAN DEFINITION:

```
COMMON/TCFCOM/TTACOF,TT4COF,TT7COF
```

VARIABLES AND ARRAYS

NAME	TYPE	DIM	FMT	DESCRIPTION
TTACOF(MIDLOHI,IB,IG,IP,IVT)	R	2*3*9*3*6	R	A real array that contains low/hi temperature correction factor coefficients for vehicle types 1,2,3,5,6,8. Nonstandard subscripts correspond to the following:

IVT	Vehicle Type
1	1-LDGV.
2	2-LDGT1.
3	3-LDGT2.
4	5-LDDV.
5	6-LDDT.
6	8-MC.

MIDLOHI	
0	No temperature correction.
1	Lo temperature coefficient
2	Hi temperature coefficient

TT4COF(MIDLOHI,IG,IP)	R	2*9*3	R	Lo/hi temperature correction factor coefficients for vehicle type 4 (HDGV).
TT7COF(MIDLOHI,IP)	R	2*3	R	Lo/hi temperature correction factor coefficients for vehicle type 7 (HDDV).

Equivalent arrays are used to initialize TTACOF and TT4COF. The names of the equivalent arrays are constructed by replacing the second character of "TTACOF" or "TT4COF" with the vehicle number and the third character with the pollutant number. Thus, T63COF initializes data for vehicle type 6 (LDDT) and pollutant 3 (NOx).

COMMON NAME: VMXCOM

DESCRIPTION: Common area used to store the VMT mix.

FORTRAN DEFINITION:

```
COMMON/VMXCOM/VMTMIX
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
VMTMIX(IV)	R	8	R	A real array used to store the VMT mix.

COMMON NAME: XCFS1

DESCRIPTION: Common area used to store optional light duty vehicle correction factor data (LDGV, LDGT1, and LDGT2).

FORTRAN DESCRIPTION

```
COMMON/XCFS1/AC,XLOAD,TRAILR,ABSHUM,DB,WB
```

VARIABLES AND ARRAYS

NAME	TYPE	DIM	FMT	DESCRIPTION
AC	R	--	R	Factor indicating optional use of air conditioning correction factor.
XLOAD(IVG)	R	3	R	Fraction of vehicles with an extra 500 lbs. load.
TRAILR(IVG)	R	3	R	Fraction of vehicles towing a trailer.
ABSHUM	R	--	R	Ambient absolute humidity (grains of water per pound of dry air).
DB	R	--	R	Dry bulb temperature (degrees Fahrenheit).
WB	R	--	R	Wet bulb temperature (degrees Fahrenheit).

COMMON NAME: YEARS4

DESCRIPTION: Common area used to store integral four-digit values of specified years.

FORTRAN DEFINITION:

```
COMMON/YEARS4/IY1951,IY1970,IY2020
```

VARIABLES AND ARRAYS:

NAME	TYPE	DIM	FMT	DESCRIPTION
IY1951	I	--	I	Year 1951.
IY1970	I	--	I	Year 1970.
IY2020	I	--	I	Year 2020.

A.3 MODULE DESCRIPTIONS

MODULE NAME:

MAIN PROGRAM

DESCRIPTION:

MAIN controls overall program execution. It consists of a sequence of subroutine calls.

MAIN first initiates "housekeeping" operations by a call to INPUT. It then proceeds through a series of subroutine calls which are listed below:

1. INPUT - to read input data describing desired calculations.
2. EFCALX - to calculate emission factors.
3. OUTPUT - to output the emission factor calculations.

This sequence of calls is repeated until the input data set is exhausted. There is an optional subroutine call to REGMOD between the call to INPUT and the call to EFCALX which generates new travel fractions when appropriate.

SUBORDINATE MODULES:

INPUT - Reads in data describing desired calculations.

REGMOD - Adjust model year mileage and registration arrays for a January 1 calendar year analysis. Computes travel fraction.

EFCALX - Calculates emission factors.

OUTPUT - Outputs all calculated emissions according to output specifications.

COMMON AREAS USED:

FLGCOM
IOUCOM
REGCOM

NOTE: All common areas are declared in MAIN.

MAIN PROGRAM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
INITFL	I	--	I	Flag indicating whether the ONE-TIME data has been read by routine INPUT.
ICY	I	--	I	Standard variable.
EFRETM(IP,IV)	R	3*9	R	Calculated emission factors.
WTEDEF(IP)	R	3	R	All vehicles combined emission factors.
COMCCC(IV)	R	9	R	Crankcase and evaporative HC emission factors.
IDLRTM(IP,IV)	R	3*9	R	Hot stabilized idle emission factors.
IDLWTD(IP)	R	3	R	All vehicles combined hot stabilized idle emission factors.
INERR	I	--	I	Error count.
ICYOLD	I	--	I	Holding value for the previous value of ICY.
ALTOLD	R	--	R	Holding value for the previous value of ALT.
IROLD	I	--	I	Holding value for the previous value of IREJN.

COMMON VARIABLES USED:

ALT	R	--	R	Common REGCOM.
IREJN	I	--	I	Common REGCOM.
IOUERR	I	--	I	Common REGCOM.
IRDFLG	I	--	I	Common FLGCOM.

MODULE NAME:

REAL FUNCTIONS BEF AND BEFIDL

DESCRIPTION:

BEF and BEFIDL determine the basic exhaust and idle model year emission levels using the appropriate zero mile emission levels, emission deterioration rates, and fleet average cumulative mileages. These functions replace the MOBILE1 subroutine BEFGEN.

SAMPLE CALL:

```
X = BEF(MY,ICY,IG,IP,IV,IR,VMTAGE,EXMVAL)

X = BEFIDL(IG,IP,IV,IR,VMTAGE,EXMVAL)
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
BEF	R	OUT	--	R	A real function name that returns a basic exhaust emission level optionally adjusted for methane and/or inspection/maintenance.
BEFIDL	R	OUT	--	R	A real function name that returns an idle emission level optionally adjusted for methane. No adjustments are made for inspection/maintenance.
MY	I	IN	--	I	An integer variable that contains the 4-digit model year.
ICY	I	IN	--	I	An integer variable that contains the 4-digit calendar year.
IG	I	IN	--	I	Model year group from function INDX3R.
IP	I	IN	--	I	An integer variable that contains an emission (pollutant) index/code. Values are 1=HC, 2=CO, and

					3=NOx.
IV	I	IN	--	I	An integer variable that contains a vehicle type code. IV is currently expected to contain values in the range 1 through 8. This variable was often called IMODE in the MOBILE1 program.
IR	I	IN	--	I	An integer variable that contains a region code. Current codes are as follows: 1. 49-State Low altitude. 2. California Low altitude. 3. 49-State High altitude.
VMTAGE	R	IN	--	R	Average fleet vehicle miles traveled/10,000..
EXMVAL	R	IN	--	R	Non-methane fraction of total HC emissions.

SUBORDINATE MODULES:

PCLEFT -- Used by BEF to adjust the basic emission level for Inspection/Maintenance.

COMMON AREAS USED:

BEF uses BASECM DELCOM
BEFIDL uses IDLBCM IDLDCM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION

--None--

INPUT VARIABLES:

NAME	METHOD
MY,ICY,IG,IP,IV,IR,VMTAGE,EXMVAL	argument

FUNCTIONS BEF AND BEFIDL

BASE3R	Common BASECM (BEF only)
DEL3R	Common DELCOM (BEF only)
IDLB3R	Common IDLBCM (BEFIDL only)
IDEL3R	Common IDLDCM (BEFIDL only)

OUTPUT VARIABLES:

NAME	METHOD
BEFIDL	function name
BEF	function name

MODULE NAME:

REAL FUNCTION CCEVRT

DESCRIPTION:

CCEVRT determines the crankcase and evaporative HC emission levels which are added to the basic HC emission levels in the computation of the HC emission factors. This version makes use of the miles travelled per day, trips per day, diurnal emission levels, and hot soak emission levels in its calculations. Function CCEVRT performs calculations previously performed by subroutine CCEVAX in MOBILE1.

SAMPLE CALL:

X = CCEVRT(MY,IV,IR)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
CCEVRT	R	OUT	--	R	A real function name that returns a crankcase and evaporative HC emission level.
MY	I	IN	--	I	An integer variable that contains the 4-digit model year.
IV	I	IN	--	I	An integer variable that contains a vehicle type code. IV is currently expected to contain values in the range 1 through 8. This variable was often called IMODE in the MOBILE1 program.
IR	I	IN	--	I	An integer variable that contains a region code. Legitimate values are 1 through 3.

SUBORDINATE MODULES:

XMPD, TPD, CRANKC, DIURNL, HOTSOK

FUNCTION CCEVRT

COMMON AREAS USED:

NONE

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
X	R	--	R	Intermediate variable.

INPUT VARIABLES:

NAME	METHOD
MY,IV,IR	arguments

OUTPUT VARIABLES:

NAME	METHOD
CCEVRT	function name

MODULE NAME:

REAL FUNCTIONS HOTSOK, TPD, DIURNL, XMPD, CRANKC

DESCRIPTION:

Real functions used by CCEVRT to determine crankcase and evaporative HC emission level calculation terms.

SAMPLE CALL:

```
X1 = HOTSOK(MY,IV,IR)

X2 = TPF(MY,IV,IR)

X3 = DIURNL(MY,IV,IR)

X4 = XMPD(MY,IV,IR)

X5 = CRANKC(MY,IV,IR)
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
HOTSOK	R	OUT	--	R	A real function name that returns the hot soak evaporative HC emission level for the given model year, vehicle type, region.
TPD	R	OUT	--	R	A real function name that returns the miles per day for the given model year, vehicle type, region.
DIURNL	R	OUT	--	R	A real function name that returns the diurnal evaporative HC emission level for the given model year, vehicle type, region.
XMPD	R	OUT	--	R	A real function name that returns the miles per day for the given model year, vehicle type, region.

CRANKC	R	OUT	--	R	A real function name that returns the crankcase HC evaporative emission level for the given model year, vehicle type, region.
MY	I	IN	--	I	An integer that contains the 4-digit model year.
IV	I	IN	--	I	An integer that contains a vehicle type code.
IR	I	IN	--	I	An integer that contains a region code.

SUBORDINATE MODULES:

QUITER

COMMON AREAS USED:

HOTCOM used by HOTSOK

TPDCOM used by TPD

DIUCOM used by DIURNL

XMPCOM used by XMPD

CRACOM used by CRANKC

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IG	I	--	I	An integer used to store a group subscript for the coefficient array.

INPUT VARIABLES:

NAME	METHOD
MY,IV,IR	arguments
MAXHOT,HOTVAL,IHOTYS	Common HOTCOM(HOTSOK only)
MAXTPD,TPDVAL,ITPDYS	Common TPDCOM(TPD only)
MAXDIU,DIUVAL,IDIUYS	Common DIUCOM(DIURNL only)
MAXXMP,XMPVAL,IXMPYS	Common XMPCOM(XMPD only)
MAXCRA,CRAVAL,ICRAYS	Common CRACOM(CRANKC only)

OUTPUT VARIABLES:

NAME	METHOD
HOTSOK,TPD,DIURNL, XMPD,CRANKC	function names

MODULE NAME:

REAL FUNCTION PCLEFT

DESCRIPTION:

PCLEFT determines the adjustment that is applied to the basic exhaust emission levels for an inspection/maintenance program. This function replaces the MOBILE1 subroutine LDVIMX. Adjustments are determined for light duty gasoline vehicles and optionally for light duty gasoline powered trucks; a value of one is returned for other vehicles.

SAMPLE CALL:

X = PCLEFT(MY,ICY,IP,IV)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
PCLEFT	R	OUT	--	R	A real function name that returns an inspection/maintenance adjustment term to the basic exhaust emission level.
MY	I	IN	--	I	An integer variable that contains the 4-digit model year.
ICY	I	IN	--	I	An integer variable that contains the 4-digit calendar year.
IP	I	IN	--	I	An integer variable that contains the emission (pollutant) code.
IV	I	IN	--	I	An integer variable that contains the vehicle type code.

SUBORDINATE MODULES:

NONE

COMMON AREAS USED:

IMCOM
IMCRED
FLGCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
AGE1ST	I	--	I	Age at which the oldest vehicle of a model year receives its first required inspection.
BY	I	--	I	The number of required inspections encountered by the oldest vehicles of a model year as of January 1, ICY.
IOP	I	--	I	To realign the IOPT variable to be in the 10 through 50 percent range.
IOPT	I	--	I	The user supplied Technology IV identification rate. The default is 50 percent and the valid range is 50 through 90 percent.
IREM	I	--	I	The remainder of the stringency or identification rate.
ISTRN	I	--	I	The user supplied stringency rate for the Technology I and II vehicle types.
ITECH	I	--	I	The Technology vehicle type (I,II, or IV).
MT	I	--	I	To indicate the existence of mechanics training (IMTFLG + 1; 1 = no, 2 = yes).
PCRED	R	--	R	The percent the emission is reduced due to an I/M program.

REM	R	--	R	The remainder expressed as a fraction (IREM/100).

INPUT VARIABLES:

NAME	METHOD
MY, ICY, IP, IV	arguments
IMTFLG, ISTRIN ICYIM, MODYR1, MODYR2, ILDT, IOPTN, NUDATA, NLINES, STRING	Common IMCOM
IRED, ITECH4	Common IMCRED
IMFLG	Common FLGCOM

OUTPUT VARIABLES:

NAME	METHOD
PCLEFT	function name

MODULE NAME:

POINTER FUNCTIONS

DESCRIPTION:

Integer functions to determine model year group subscripts for MOBILE2 arrays. These functions replace arrays of the same name in earlier versions of MOBILE1/MOBILE2. Function arguments are related to, although not always exactly the same as, the subscripts of the earlier arrays. These functions provide a secondary index into MOBILE2 arrays. Use of a secondary index permits a substantial reduction of what would otherwise be extremely large data arrays. In the early versions of MOBILE1/MOBILE2, the index arrays themselves were large. Changing the arrays to functions (1) made it possible to use a more natural method of identifying the model year and (2) made it possible to substantially reduce the size of the index arrays.

The following table lists the pointer functions, the name of the array that each function indexes, the name of the common area used by the function to compute the index, and a list of subprograms that use the function.

FUNCTION CALL	ARRAYS INDEXED	COMMON USED	USING SUBPROGRAMS
INDX3R(MY,IP,IV,IR)	BASE3R,DEL3R, IDLB3R,IDEL3R	INDXCM	EFALTX,EFCALX
IGPPTR(MY,IP,IR,IV)	TTACOF,TT4COF, GPACOF,GPBCOF	PTRCOM	BIGCFX
ISPPTR(MY,IR,IV)	SPBACK	ISPCOM	BIGCFX
ISPPTB(MY,IR,IP)	SPBACK	ISPCOM	BIGCFX
IEXMPT(MY,IV,IR)	EXMETH	BEFGCM	EFCALX
IGEPTR(MY,IV,IR)	ACEQIP	ALUPTR	ALUH
IGUPTR(MY,IV,IR)	ACCF	ALUPTR	ALUH
IGLPTR(MY,IV,IR)	XLCF	ALUPTR	ALUH
IGTPTR(MY,IV,IR)	TWCF	ALUPTR	ALUH
IGSFPT(MY,IV,IR)	GSF	GSFCOM	REGMOD, EFCALX

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
MY	I	IN	--	I	An integer that contains the 4-digit model year.
IP	I	IN	--	I	An integer that contains the emission (pollutant) code.
IR	I	IN	--	I	An integer that contains the region code.
IV	I	IN	--	I	An integer that contains the vehicle type code.

SUBORDINATE MODULES:

QUITER

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IG	I	--	I	Standard variable.

MODULE NAME:

SUBROUTINE ALUH

DESCRIPTION:

Subroutine to compute three correction factors for light duty gasoline powered vehicles and trucks; and humidity for light duty gasoline vehicles, light duty gasoline trucks, and motorcycles:

1. Air conditioning correction factor.
2. Extra load correction factor.
3. Trailer towing correction factor.
4. Humidity correction factor (applies to NOx only).

SAMPLE CALL:

CALL ALUH(ICY,IR)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
ICY	I	IN	--	I	Calendar year.
IR	I	IN	--	I	Region.

SUBORDINATE MODULES:

IGEPTR,IGUPTR,IGLPTR,IGTPTR

COMMON AREAS USED:

LNKCOM ALUCOM SYSCOM
RET1 XCFS1

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION

SUBROUTINE ALUH

ACU	R	--	R	Fraction of vehicles that are equipped with air conditioning and using it.
HHH	R	--	R	NOx humidity correction factor.
MY	I	--	I	Standard variable.
IVP	I	--	I	Vehicle type pointer.
IP	I	--	I	Standard variable.
TT	R	--	R	Temperature difference (ambient less 75 deg F).
HH	R	--	R	NOx Humidity correction factor.
XLU	R	--	R	Fraction of vehicles with an extra load.
TWU	R	--	R	Fraction of vehicles towing a trailer.
IDX	I	--	I	Standard variable.
IGU	I	--	I	A/C correction factor coefficients group pointer.
IGE	I	--	I	Fraction A.C. equipped (group pointer).
IGL	I	--	I	Fraction extra load (group pointer).
IGT	I	--	I	Fraction trailer towing (group pointer).
DI	R	--	R	Discomfort index.
DILO	R	--	R	Discomfort index below which A.C. is off (0% use).
DIHI	R	--	R	Discomfort index above which A.C. is on (100% use).

INPUT VARIABLES:

NAME	METHOD
ICY, IR	argument
AC, XLOAD, TRAILR, ABSHUM	Common XCFS1

SUBROUTINE ALUH

DB, WB	Common XCFS1
MAXLTW	Common SYSCOM
TAMB	Common LNKCOM

OUTPUT VARIABLES:

NAME	METHOD
ALHRET	Common RET1
AC	Common XCFS1

SUBROUTINE ALUH

MODULE NAME:

SUBROUTINE BIGCFX

DESCRIPTION:

Subroutine to determine a correction factor that is applied to the basic exhaust emission levels. The correction factor provides a correction for speed, temperature, humidity, trailer towing, extra load, air conditioning, and percent vehicle-miles-travelled in cold/hot starts.

SAMPLE CALL:

CALL BIGCFX (ICY,IR,CFRET)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
ICY	I	IN	--	I	An integer that contains the 4-digit calendar year.
IR	I	IN	--	I	An integer that contains the region code.
CFRET(IDX,IP,IV)	R	OUT	20*3*8	R	An array that returns combined correction factors for the region.

COMMON AREAS USED:

FLGCOM, XCFS1, RET1, SYSCOM, IVPCOM, TCFCOM, GPCCOM, LNKCOM, CUMCOM

SUBORDINATE MODULES:

SPFCLX,ALUH,IGPPTR,ISPPTR,ISPPT8

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
NCATYR(IV)	I	8	I	An integer array used to store the last non-catalyst model year

				for the eight vehicle types.
FCN	R	--	R	Fraction VMT cold start (non-catalyst).
FHC	R	--	R	Fraction VMT hot start (catalyst).
FCC	R	--	R	Fraction VMT cold start (catalyst).
FHN	R	--	R	Fraction VMT hot start (non-catalyst).
MDLOHI	I	--	I	An integer used to indicate that the low, middle, or high temperature correction is to be applied. MDLOHI is given a value of 0 for mid, 1 for low, and 2 for high.
TCF(IB)	R	3	R	A real vector used to store a temperature correction factor for each bag emission.
SADJ	R	--	R	The speed represented by the percentage of VMT in a 26 mph cold start, a 26 mph hot start, and a 16 mph stabilized mode.
SCF	R	--	R	An intermediate accumulator whose final value is stored in SCFADJ.
SCFADJ(IP,IVA)	R	3*4	R	An adjustment to the speed correction factor SPBACK; the adjustment is for the change in speed from 19.6 mph to SADJ.
ISPGRP(IP,IVA)	R	3*4	R	The speed coefficient group last used for the given vehicle-type/pollutant. Saving this value eliminates the necessity of recalculating SCFADJ for every model year.
IDX	I	--	I	Standard variable.
JDX	I	--	I	Standard variable.
IVG	I	--	I	An integer used as a vehicle group pointer into arrays

				GPACOF, and ISPPTR.
IVB	I	--	I	An integer used as a vehicle group pointer into array GPBCOF.
IVT	I	--	I	An integer used as a vehicle group pointer into array TTACOF.
IVA	I	--	I	An integer used as a vehicle group pointer into arrays ALHRET, SCFADJ, and ISPGRP.
IS	I	--	I	An integer used as a model year group pointer into array SPBACK for LDG.
ISAVE	I	--	I	Temporary storage for model year group pointer.
CHFRAC(IB)	R	3	R	An array used to store the cold / stabilized / hot VMT fractions for a given vehicle type / model year.
SPDGPB	R	--	R	An accumulator used to store speed expressions.
XMILES	R	--	R	A real variable used to store the accumulated miles per IDX, IV.
S	R	--	R	A real variable used to store the vehicle speed.
BAGSUM	R	--	R	A real variable used to store accumulated bag correction factors.
SPBACK(IS,IP,IV)	R	18*3*8	R	An array used to store speed correction factors, which adjust emissions at 19.6 mph to emissions at the user input speed.
IB	I	--	I	An integer variable used to store the bag number subscript.
TT	R	--	R	A real variable used to store the temperature in degrees Fahrenheit for the temperature correction factors.

SUBROUTINE BIGCFX

INPUT VARIABLES:

NAME	METHOD
ICY,IR	arguments
ALHFLG	Common FLGCOM
SPD,TAMB,PCCN,PCHC,PCCC	Common LNKCOM
MAXPOL, MAXVEH	Common SYSCOM
IVPTRG,IVPTRT,IVPTRA,IVPTRB	Common IVPCOM
TTACOF,TT4COF,TT7COF	Common TCFCOM
GPACOF,GPBCOF	Common GPCCOM
CUMMIL	Common CUMCOM

OUTPUT VARIABLES

NAME	METHOD
CFRET	arguments

MODULE NAME:

BLOCK DATA SUBPROGRAMS 1 TO 21

DESCRIPTION:

The following table lists the common areas, variables, and arrays initialized by each block data subprogram. The documentation for the individual common areas contains more information about the variables and arrays.

Note: Array names enclosed in square brackets are arrays that are EQUIVALENCEd to portions of the previously listed array(s). These bracketed arrays are local to the BLOCK DATA and are solely for convenience during data initialization.

BLOCK DATA NO.	COMMON	VARIABLES AND ARRAYS
1	ACOM	AIN1,AIN2,AIN3, [A11,A12,A21,A22,A31,A32]
2	MYMSAV	SAVMYM,SAVMYR
	VMXCOM	VMTMIX
3	INDXCM	INDXYR [INDX49,INDXCA,INDXHI] [IN49V1...IN49V8] [INCAV1...INCAV8] [INHIV1...INHIV8]
4	BASECM	BASE3R [BASE49,BASECA,BASEHI] [B41,B42,BC1,BC2,BH1,BH2]
	DELCOM	DEL3R [DEL49,DELCA,DELHI] [D41,D42,DC1,DC2,DH1,DH2]
5	IDLBCM	IDLB3R [IDLB49,IDLBCA,IDLBHI] [IB41,IB42,IBC1,IBC2] [IBH1,IBH2]
	IDLDCM	IDEL3R [IDEL49,IDELCA,IDELHI] [IL41,IL42,ILC1,ILC2,]

		[ILH1,ILH2]
6	IMCRED	IRED,ITECH4 [R1 thru R20] [T1 thru T5]
7	BEFGCM	EXMETH,IEXMYR,[EXMET1], [EXMET2,EXMET3,IEXMY1,] [IEXMY2,IEXMY3]
8	HOTCOM	MAXHOT,HOTVAL,IHOTYS [HOTVA1,HOTVA2,HOTVA3] [IHOTY1,IHOTY2,IHOTY3]
9	TPDCOM	MAXTPD,TPDVAL,ITPDYS [TPDVA1,TPDVA2,TPDVA3] [ITPDY1,ITPDY2,ITPDY3]
10	DIUCOM	MAXDIU,DIUVAL,IDIUYS [DIUVA1,DIUVA2,DIUVA3] [IDIUY1,IDIUY2,IDIUY3]
11	XMPCOM	MAXXMP,XMPVAL,IXMPYS [XMPVA1,XMPVA2,XMPVA3] [IXMPY1,IXMPY2,IXMPY3]
12	CRACOM	MAXCRA,CRAVAL,ICRAYS [CRAVA1,CRAVA2,CRAVA3] [ICRAY1,ICRAY2,ICRAY3]
13	YEARS4	IY1951,IY1970,IY2020
	ALTEQU	MAXEQU
	SYSCOM	MAXVEH,MAXLTW,MAXPOL, MAXREG,INITPR
	IVPCOM	IVPTRG,IVPTRT,IVPTRA,IVPTRB
14	TCFCOM	TTACOF,TT4COF,TT7COF [T11COF,T12COF,T13COF] [T21COF,T22COF,T23COF] [T31COF,T32COF,T33COF] [T51COF,T52COF,T53COF] [T61COF,T62COF,T63COF] [T81COF,T82COF,T83COF]
15	GPCCOM	GPACOF,GPBCOF [GPAC11,GPAC12,GPAC13] [GPAC21,GPAC22,GPAC23] [GPAC31,GPAC32,GPAC33] [GPAC51,GPAC52,GPAC53] [GPAC61,GPAC62,GPAC63]

		[GPAC81,GPAC82,GPAC83] [GPBC04,GPBC05,GPBC06,] [GPBC07]
16	PTRCOM	IGPYRS,MAXIGP [IGPYR1...IGPYR8]
17	ISPCOM	ISPYRS,ISPYR8 [ISPYR1,ISPYR2,ISPYR3]
18	ALUCOM	ACEQIP,ACCF,XLCF,TWCF [XLCF1,XLCF2,XLCF3,] [TWCF1,TWCF2,TWCF3]
19	ALUPTR	IGEYRS,IGUYRS,IGLYRS, IGTYRS
20	GSFCOM	MAXGSF,GSF,IGSFYR [GSF1,GSF2,GSF3,] [IGSFY1,IGSFY2,IGSFY3]
21	IOUCOM	IOUIMD,IOUGEN,IOUREP IOUERR,IOUASK,IOUUNF

MODULE NAME:

SUBROUTINE CCEVAX

DESCRIPTION:

Subroutine to move user supplied trip per day and miles per day data from the "working" Common CEVCOM to Commons XMPCOM and TPDCOM. In MOBILE1, CCEVAX computed crankcase and evaporative HC emission factors. That function is performed in MOBILE2 by CCEVRT.

SAMPLE CALL:

CALL CCEVAX

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
		----- NONE -----			

SUBORDINATE MODULES:

NONE

COMMON AREAS USED:

FLGCOM YEARS4 XMPCOM
CEVCOM SYSCOM TPDCOM

LOCAL VARIABLES

NAME	TYPE	DIM	FMT	DESCRIPTION
I	I	--	I	Loop index.
IV	I	--	I	Standard variable.
IR	I	--	I	Standard variable.

INPUT VARIABLES:

NAME	METHOD
MAXVEH, MAXREG	Common SYSCOM
IY2020	Common YEARS4
USRTPD, USRMPD	Common CEVCOM
MAXXMP	Common XMPCOM
MAXTPD	Common TPDCOM

OUTPUT VARIABLES:

NAME	METHOD
XMPVAL, IXMPYS	Common XMPCOM
TPDVAL, ITPPYS	Common TPDCOM

MODULE NAME:

SUBROUTINE EFALTX

DESCRIPTION:

EFALTX is designed to allow the user to modify the model year basic exhaust emission rates used in computing the emission factors. This is useful, for example, in estimating the impacts of changes in new vehicle emission standard timetables. EFALTX also zeroes out the idle emission rates which would correspond to the vehicle type, region, and pollutant of the altered basic exhaust emission rates.

SAMPLE CALL:

```
CALL EFALTX(INERR)
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
INERR	I	IN	--	I	Program error count.

SUBORDINATE MODULES:

QUITER, INDX3R

COMMON AREAS USED:

ALTCOM
INDXCM
BASECM
DELCOM
ALTEQU
SYSCOM
IDLBCM
IDLDCM

LOCAL VARIABLES

NAME	TYPE	DIM	FMT	DESCRIPTION
IFAC	I	--	I	Counter for number of input zero mile and deterioration rate pairs.
IEQU	I	--	I	Loop index to zero the idle equations.
NEWPTR	I	--	I	Subscript where the new equation will be inserted, or zero if no space.
IV	I	--	I	Standard variable.
IR	I	--	I	Standard variable.
IP	I	--	I	Standard variable.

INPUT VARIABLES:

NAME	METHOD
NEWFAC, INTALT, R4ALT	Common ALTCOM
MAXEQU	Common ALTEQU

OUTPUT VARIABLES

NAME	METHOD
MODFLG	Common ALTCOM
BASE3R	Common BASECM
DEL3R	Common DELCOM
IDLB3R	Common IDLBCM
IDEL3R	Common IDLDCM
INDXYR	Common INDXCM

MODULE NAME:

SUBROUTINE EFCALX

DESCRIPTION:

EFCALX computes the emission factors. It first calls BIGCFX, which computes the speed/temperature/cold-hot start correction factors.

SAMPLE CALL:

```
CALL EFCALX (ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD,INERR)
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
ICY	I	IN	--	I	Calendar year.
EFRETM(IP,IV)	R	OUT	3*9	R	Emission factors (g/mile) for vehicle type IV and pollutant IP. Note: The subscript IV=9 is used for combined LDGTs (=LDGT1+LDGT2).
WTEDEF(IP)	R	OUT	3	R	Emission factor for all vehicle types combined (g/mile).
COMCCC(IV)	R	OUT	9	R	Crankcase and evaporative HC emission factors (g/mile) for vehicle type IV.
IDLRTM(IP,IV)	R	OUT	3*9	R	Hot stabilized idle emission factors (g/minute) for vehicle type IV and pollutant IP.
IDLWTD(IP)	R	OUT	3	R	Hot stabilized idle emission factors for all vehicle types combined (g/minute).
INERR	R	OUT	--	I	Program error count.

SUBORDINATE MODULES:

GETCUM
BIGCFX
BEF
BEFIDL
CCEVRT
IGSFPT
IEXMPT
QUITER
INDX3R

COMMON AREAS USED:

FLGCOM
REGCOM
MYMCOM
CUMCOM
SYSCOM
VMXCOM
GSFCOM
BEFGCM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IR	I	--	I	Standard variable.
IV	I	--	I	Standard variable.
IP	I	--	I	Standard variable.
CFRET(IDX,IP,IV,IR)	R	20*3*8*2	R	Correction factor for speed/temperature/cold-hot start. The final dimension (region) is equal to 2 to accomodate intermediate altitude. In this case, the subscript 1 will be used for low altitude, and the subscript 2 for high altitude.
COMPCC	R	--	R	Crankcase and evaporative HC emission factor for a given vehicle-type / model-year /

				calendar-year.
COMPEF	R	--	R	Emission factor for a given vehicle-type / pollutant / model-year / calendar-year.
IDLFAC	R	--	R	Idle emission factor for a given vehicle-type / pollutant / model-year / calendar-year.
INITFL	I	--	I	An integer used to indicate that subroutine GETCUM has been called.
JREJN	I	--	I	An integer used as a local variable to indicate region.
IGS	I	--	I	An integer used as a group subscript for array GSF.
IEX	I	--	I	An integer used as a group subscript for array EXMETH.
X23	R	--	R	A real variable equal to the sum of VMTMIX(2) + VMTMIX(3).
INDX1	I	--	I	Group pointer value returned from INDX3R.
VMTAGE	R	--	R	Cumulative vehicle miles travelled/10,000.
EXMVAL	R	--	R	Non-methane HC fraction for a given vehicle-type / model-year / region.

INPUT VARIABLES:

NAME	METHOD
ICY	argument
TF	Common MYMCOM
MAXVEH, MAXPOL	Common SYSCOM
ALT, IREJN	Common REGCOM
ALTFLG	Common FLGCOM
VMTMIX	Common VMXCOM
GSF, IGSFYR	Common GSFCOM
EXMETH, IEXMYR	Common BEFGCM

OUTPUT VARIABLES

NAME	METHOD
SUBROUTINE EFCALX	

EFRETM, WTEDEF, COMCCC IDLRTM, IDLWTD, INERR	arguments

MODULE NAME:

SUBROUTINE GETCUM

DESCRIPTION:

GETCUM calculates the January 1 cumulative average mileages for the eight vehicle type fleets.

These values are used in BEF and BEFIDL to compute model year emission factors, and in BIGCFX to compute speed/temperature/cold-hot start correction factors.

SAMPLE CALL:

CALL GETCUM

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION

----- NONE -----

SUBORDINATE MODULES:

NONE

COMMON AREAS USED:

MYMCOM
CUMCOM
SYSCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IV	I	--	I	Standard variable.
IDX	I	--	I	Standard variable.

OUTPUT VARIABLES:

NAME	METHOD
CUMMIL	Common CUMCOM

INPUT VARIABLES:

NAME	METHOD
XMYM	Common MYMCOM
MAXVEH	Common VEHCOM

MODULE NAME:

SUBROUTINE INPUT

DESCRIPTION:

Subroutine to read the input data for MOBILE2. It optionally prompts for this data, if the appropriate flag is set.

SAMPLE CALL:

CALL INPUT(INITFL,ICY,INERR)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
INITFL	I	I/O	--	I	Indicator to read CONTROL and ONE-TIME DATA Sections (INITFL=1) or PARAMETER Section (INITFL=0).
ICY	I	OUT	--	I	Calendar year.
INERR	I	OUT	--	I	An integer variable that returns the number of input errors detected by INPUT.

SUBORDINATE MODULES:

QUITER
YRTEST
NEWDAT
EFALTX
OUTHDR
CCEVAX

COMMON AREAS USED:

FLGCOM
LNKCOM
ALTCOM
XCFS1
SYSCOM
PROJCM
IMCOM
REGCOM
YEARS4
MYMSAV
VMXCOM
CEVCOM
IOUCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
BASNEW	R	--	--	User supplied zero mile basic exhaust emission level (grams/mile).
DELNEW	R	--	--	User supplied emission deterioration rate per 10,000 miles (grams/mile/10K miles).
(I,J,L,M,N)	I	--	I	General integer work variables.
X and SUM	R	--	R	General real work variables.
IFAC	I	--	--	Counter for number of input zero mile and deterioration rate pairs.
IMDALT	I	--	I	Temporary storage location for vehicle type.
INFLAG	I	--	I	Chooses type of FORTRAN READ, i.e. list directed or formatted (formatted read is always used unless program alterations are made).
IPLALT	I	--	I	Temporary storage location for pollutant.
IPROMT	I	--	I	Flag which indicates prompting/non-prompting option and CONTROL Section input format.
IRGALT	I	--	I	Temporary storage location for region.
MYFRST	I	--	I	Temporary storage location for first model year of altered emission rates.
MYLAST	I	--	I	Temporary storage location for last model year of altered emission rates.
NAMMMR(4,2,8)	I	4*2*8	A4	Prompting messages for XMYM/XMYR input.

IVP	I	--	I	Loop index used in conjunction with MAXLTW.
VMFLAG	I	--	I	Flag used to indicate whether or not to read user VMT mix.
TRKFLG	I	--	I	Flag for truck parameter input (ignored, but preserved for MOBILE1 compatibility).
IPRSAV	I	--	I	Temporary storage for IPROMT value.
IOUNEW(4)	I	4	I	Input/Output unit numbers.
IOUREF(9)	I	9	A	Character representations of integers 1 through 9.
IOUOLD(4)	I	4	I	Input/Output unit numbers.
JUNIT	I	--	I	Working value of a given I/O unit.
IOUSUM	I	--	I	Sum of I/O unit numbers.
UNFFLG	I	--	I	Flag for unformatted output (ignored, but preserved for MOBILE1 compatibility).
IDUM	I	--	A4	Dummy input variable.

INPUT VARIABLES:

NAME	METHOD
INITFL	argument
MAXVEH, MAXLTW	Common SYSCOM
IOUGEN,IOUASK,IOUREP,IOUERR,IOUUNF	Common IOUCOM
IY1951, IY1970, IY2020	Common YEARS4

OUTPUT VARIABLES:

NAME	METHOD
INITFL,INERR,ICY	argument

SUBROUTINE INPUT

SPDFLG,MYMRFG, ALTFLG,IMFLG,ALHFLG, IFORM,PRTFLG,ICEVFG, IDLFLG,NMHFLG,MDEFLG,IRDFLG	Common FLGCOM
SPD,TAMB,PCCN PCHC,PCCC	Common LNKCOM
SAVMYM,SAVMYR	Common MYMSAV
NEWFAC,INTALT,R4ALT,MODFLG	Common ALTCOM
ICYIM,ISTRIN,IMTFLG MODYR1,MODYR2,ILDT,IOPTN,NUDATA	Common IMCOM
IREJN,ALT	Common REGCOM
AC,XLOAD,TRAILR,ABSHUM,DB,WB	Common XCFS1
PROJID	Common PROJCM
IOUREP, IOUERR, IOUASK, IOUUNF	Common IOUCOM

MODULE NAME:

SUBROUTINE NEWDAT

DESCRIPTION:

Subroutine to read user supplied inspection/maintenance credits for Technology types I, II, & IV, and associated text from unit 4.

SAMPLE CALL:

CALL NEWDAT(IRDFLG)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
IRDFLG	I	OUT	--	I	An integer that returns a status code to the calling module.

SUBORDINATE MODULES:

NONE

COMMON AREAS USED:

IMCRED, IMCOM, IOUCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
AGE1ST	I	--	I	The age at which the oldest vehicle of a model year receives its first required inspection.
BY	I	--	I	The number of required inspections encountered by the oldest vehicle of a model year as of January 1, ICY.
IP	I	--	I	Pollutant code.
ISTRN	I	--	I	Stringency.

ITECH	I	--	I	Technology type.

INPUT VARIABLES:

NAME	METHOD
IOUIMD, IOUERR	Common IOUCOM
NUDATA	Common IMCOM

OUTPUT VARIABLES:

NAME	METHOD
NLINES	Common IMCOM
IRDFLG	argument
IRED, ITECH4	Common IMCRED
STRING	Common IMCOM

MODULE NAME:

SUBROUTINE OUTPUT, OUTHD0...OUTHD4, OUTDT0...OUTDT4, OUTHDR, OUTALT, OUTMTH, OUTPOL, OUTIMP

DESCRIPTION:

Subroutines to print formatted reports. Subroutine OUTPUT is the highest level module. OUTPUT selects and calls appropriate subordinate subroutines OUTHD<0-4> and OUTDT<0-4>, where <0-4> represents one numeric character '0' thru '4' in the subroutine name. OUTPUT selects and calls the subroutine that has a final character in the subroutine name that corresponds to the value of variable IFORM, IFORM = 0 thru 4.

The report header subroutines OUTHD<0-4> all call subroutine OUTHDR to print a scenario title. Header subroutines OUTHD1, OUTHD3, and OUTHD4 also call subroutine OUTMTH. OUTHD1, OUTHD3 and OUTHD4 call OUTALT to print the alternative equations if ALTFLG = 1.

The report detail subroutines OUTDT<0-4> print report details. These subroutines call subroutine OUTPOL to set do-loop indices for the number of pollutants to be printed.

The report header subroutines OUTHD<0-4> all call subroutine OUTHDR to print a scenario title. Header subroutines OUTHD1, OUTHD3, and OUTHD4 call OUTMTH to prepare report text to indicate that hydrocarbon emission factors are non-methane or total hydrocarbon. OUTMTH also prints a message to indicate that hydrocarbon emission factors include crankcase and evaporative HC emissions.

Subroutines OUTDT<0-4> print report details. These subroutines call OUTPOL to determine do-loop indices for the pollutants to be printed. OUTDT1, OUTDT3, and OUTDT4 call OUTIMP to print the I/M program data when IMFLG equals one.

SAMPLE CALL:

```
CALL OUTPUT(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)

CALL OUTHD0
CALL OUTHD1
CALL OUTHD2
CALL OUTHD3
CALL OUTHD4

CALL OUTDT0(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
CALL OUTDT1(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
CALL OUTDT2(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
CALL OUTDT3(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
CALL OUTDT4(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)

CALL OUTHDR(IOUOUT)
CALL OUTALT
CALL OUTMTH

CALL OUTPOL(IP1,IP2)
CALL OUTIMP
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
ICY	I	IN	--	I	Calendar year.
EFRETM(IP,IV)	R	IN	3*9	R	Emission factors (g/mile).
WTEDEF(IP)	R	IN	3	R	Emission factors for all vehicle types combined (g/mile).
COMCCC(IV)	R	IN	9	R	Crankcase and evaporative HC emission factors (g/mile).
IDLRTM(IP,IV)	R	IN	3*9	R	Hot stabilized idle emission factors (g/minute).
IDLWTD(IP)	R	IN	3	R	Hot stabilized idle emission factors for all vehicle types combined (g/minute).
IP1	I	OUT	--	I	An integer that returns the lower do-loop pollutant index of the pollutants to be printed.
IP2	I	OUT	--	I	An integer that returns the upper do-loop pollutant index of the pollutants to be printed.
IOUOUT	I	IN	--	I	Unit number for output.

The following table lists subordinate modules and common areas used by each output subroutine.

OUTPUT SUBROUTINES

SUBROUTINE	CALLS	COMMON
OUTPUT	OUTHD<0-4>, OUTDT<0-4>	FLGCOM, SYSCOM ALTCOM REGCOM
OUTHD0	OUTHDR	IOUCOM
OUTHD1	OUTHDR,OUTALT,OUTMTH	FLGCOM, IOUCOM
OUTHD2	OUTHDR	SYSCOM, IOUCOM
OUTHD3	OUTHDR,OUTALT,OUTMTH	FLGCOM, IOUCOM
OUTHD4	OUTHDR,OUTALT,OUTMTH	FLGCOM, IOUCOM
OUTDT0	OUTPOL	FLGCOM, REGCOM, LNKCOM, VMXCOM, SYSCOM, IOUCOM
OUTDT1	OUTPOL,OUTIMP	FLGCOM, REGCOM, LNKCOM, VMXCOM, XCFS1, SYSCOM, IOUCOM
OUTDT2	OUTPOL	FLGCOM, REGCOM, LNKCOM, VMXCOM, SYSCOM, IOUCOM
OUTDT3	OUTPOL,YROUT,OUTIMP	FLGCOM, REGCOM, LNKCOM, VMXCOM, XCFS1, SYSCOM, IOUCOM

OUTDT4	OUTPOL, OUTIMP	FLGCOM, REGCOM, LNKCOM, VMXCOM, XCFS1, SYSCOM, IOUCOM
OUTHDR	--	SYSCOM, PROJCM
OUTALT	--	SYSCOM, ALTCOM, IOUCOM
OUTMTH	--	FLGCOM,
OUTPOL	--	FLGCOM, SYSCOM
OUTIMP	--	IMCOM, IOUCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IFAC	I	--	I	Counter for number of input zero mile and deterioration rate pairs.
IP	I	--	I	Standard variable.
ICY	I	--	I	2-digit calendar year.
NOYES(2)	R	2	A4	Literals "YES " and "NO ".
NAMTOT(2)	I	2	A4	Literal "TOTAL".
NAMNON(2)	I	2	A4	Literal "NON-METH".
NAMOUT(2)	I	2	A4	Contains either NAMTOT or NAMNON
IV	I	--	I	Standard variable.
IVP	I	--	I	Vehicle type pointer for light duty gasoline types.
MAXV	I	--	I	Equals MAXVEH+1.

ITAMB	I	--	I	Rounded integer ambient temperature.
I and II and JJ	I	--	I	Loop indices.
NAMNMH(2,2)	I	2*2	A4	Title "TOTAL" or "NO-MTH".
NAMPOL(3)	I	3	A4	Pollutant names.
IFORMX	I	--	I	Equals IFORM+1 for a computed GOTO.
NAMVEH	I	*	*	Vehicle names. The dimension and format are specific to each report: * 6 A4 for IFORM = 0 2*9 2A4 IFORM = 1 6 A4 IFORM = 2 2*10 2A4 IFORM = 3 2*10 2A4 IFORM = 4
NAMREG	I	**	**	Region names. The dimension and format are specific to each report. ** 2*6 A4 for IFORM = 2 4*6 A4 for IFORM = 3 4*6 A4 for IFORM = 4
INO	I	--	I	Subscript for NOYES.

INPUT VARIABLES:

NAME	METHOD
ICY, IDLWTD, IDLRTM, EFRETM, WTEDEF, COMCCC	argument
NMHFLG, MDEFLG, ALTFLG, IFORM SPDFLG, IMFLG, PRTFLG	Common FLGCOM
PROJID	Common PROJCM
NEWFAC, INTALT, MODFLG, R4ALT	Common ALTCOM

SPD,TEMP, PCCN,PCHC,PCCC	Common LNKCOM
AC,XLOAD,TRAILR,ABSUM,TLO,THI	Common XCFS1
ICYIM,ISTRIN,MODYR1,MODYR2	Common IMCOM
IREJN,ALT	Common REGCOM
VMTMIX	Common VMXCOM
IOUREP	Common IOUCOM
MAXVEH,MAXPOL,INITPR	Common SYSCOM

OUTPUT VARIABLES:

NAME	METHOD
INTACT	Common ALTCOM
IDLWTD	arguments (zeroed for alternate equations)
INITPR	Common SYSCOM

OUTPUT SUBROUTINES

MODULE NAME:

QUITER

DESCRIPTION:

Subroutine to print error messages and increment an error counter.

SAMPLE CALL:

```
CALL QUITER(X,K,NN,INERR)
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
X	R	IN	--	R	A real variable that contains an incorrect value which is to be printed.
K	I	IN	--	I	An integer variable that contains an incorrect value which is to be printed.
NN	I	IN	--	I	An integer variable that contains a unique value which identifies the error.
INERR	I	I/O	--	I	An integer that contains the current error count. QUITER increments INERR.

SUBORDINATE MODULES:

NONE

COMMON AREAS USED:

YEARS4 ALTCOM
ALTEQU IOUCOM

SUBROUTINE QUITER

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
I and N	I	--	I	Work variables.
NAMFLG(2,15)	I	2*15	2A4	An integer array which contains the names of input flags that have errors. Each of the 15 flag names requires 2 words of storage.
NAMVEH(2,IV)	I	2*8	2A4	Vehicle names. Each name requires 2 words.
NAMFNC(2,16)	I	2*16	2A4	Function names. Each of the 16 function names requires 2 words.
MAXERR	I	--	I	Maximum number error/warning messages permitted.
IOBMSG(5)	I	5	5A4	The 20-character partial message "OUT OF BOUNDS FOR ".

INPUT VARIABLES:

NAME	METHOD
X,K,NN,INERR	argument
IOUERR	Common IOUCOM
IY1951,IY1970,IY2020	Common YEARS4
MAXEQU	Common ALTEQU
INTALT	Common ALTCOM

OUTPUT VARIABLES:

NAME	METHOD

SUBROUTINE QUITER

INERR argument

SUBROUTINE QUITER

MODULE NAME:

SUBROUTINE REGMOD

DESCRIPTION

Subroutine to adjust model year mileage and registration arrays for January 1 calendar year calculations.

SAMPLE CALL:

`CALL REGMOD(ICY,INERR)`

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
ICY	I	IN	--	I	An integer variable that contains the calendar year.
INERR	I	I/O	--	I	Total count of data entry entry errors.

SUBORDINATE MODULES:

TFCALX
IGSFPT

COMMON AREAS USED:

MYMCOM
MYMSAV
SYSCOM
GSFCOM
REGSUM
REGCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
X(20)	R	20	R	Expression accumulator for a 20-year span.
S	R	--	R	Expression accumulator.
SS	R	--	R	Expression accumulator.
Z ZZ	R	--	R	Expression accumulators.

SUBROUTINE REGMOD

IGS	I	--	I	GSF array group subscript.

INPUT VARIABLES:

NAME	METHOD
ICY, INERR	argument
MAXVEH	Common VEHCOM
SAVMYM, SAVMYR	Common MYMSAV
GSF	Common GSFCOM
IREJN, ALT	Common REGCOM

OUTPUT VARIABLES:

NAME	METHOD
INERR	argument
XMYM,XMYR,TFMYM	Common MYMCOM
SUM1	Common REGSUM

MODULE NAME

SUBROUTINE SPFCLX

DESCRIPTION:

SPFCLX calculates the speed portion of the speed/temperature/cold-hot start correction factor used for gasoline powered vehicles, light duty trucks, and motorcycles.

SAMPLE CALL:

CALL SPFCLX(SPARA,SPBACK)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
SPARA(IV)	R	IN	8	R	Average speed for each vehicle type.
SPBACK(IG,IP,IV)	R	OUT	18*3*8	R	Speed portion of the speed/temperature/cold-hot start correction factor.

SUBORDINATE MODULES:

NONE

COMMON AREAS USED:

ACOM, SYSCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
IV	I	--	I	Standard variable.
IG	I	--	I	Standard variable.
IP	I	--	I	Standard variable.
IS	I	--	I	Speed coefficient subscript.

SUBROUTINE SPFCLX

S	R	--	R	Average speed.
SCF	R	--	R	Speed correction factor.

INPUT VARIABLES:

NAME	METHOD
SPARA	argument
AIN	Common ACOM
MAXVEH, MAXPOL	Common SYSCOM

OUTPUT VARIABLES:

NAME	METHOD
SPBACK	arguments

MODULE NAME:

SUBROUTINE TFCALX

DESCRIPTION:

TFCALX computes the travel fractions, which are used to weight the relative contribution of each model year to the vehicle type emission factor according to the relative VMT contribution of each model year within each vehicle type.

SAMPLE CALL:

CALL TFCALX(INERR)

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
INERR	I	I/O	--	I	Count of data entry errors.

SUBORDINATE MODULES:

QUITER

COMMON AREAS USED:

MYMCOM, VMXCOM, SYSCOM, REGSUM, FLGCOM

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
TFNORM(IV)	R	8	R	Sum of (MYM*MYR) for a given model year vehicle type.
VCOUNT(IV)	R	8	R	Number of vehicles (divided by 1,000,000) registered in 1978 for each vehicle type. For LDGV and LDDV, VCOUNT is the sum of LDGV and LDDV registration. The same is true for LDGT1 and LDDT.
TOTVMT	R	--	R	Sum of VMTMIX.

INPUT VARIABLES:

NAME	METHOD
INERR	argument
XMYR,TFMYM	Common MYMCOM
VMTMIX	Common VMTCOM
MAXVEH	Common SYSCOM

OUTPUT VARIABLES:

NAME	METHOD
INERR	argument
TF	Common MYMCOM

MODULE NAME:

SUBROUTINE YRTEST

DESCRIPTION:

Subroutine to test a calendar year for limits and adjust the year for the turn of the century. The input year is assumed to have a value equal to the last two digits of the actual year. The input two digit year is returned as a four digit year.

SAMPLE CALL:

```
CALL YRTEST(IY,NERR,IY1,IY2,INERR)
```

ARGUMENTS:

NAME	TYPE	DIR	DIM	FMT	DESCRIPTION
IY	I	I/O	--	I	An integer variable that contains the last two digits of the year. The subroutine returns a four digit year in IY.
NERR	I	I/O	--	I	An integer variable that contains an error code that identifies the error condition to QUITER when the input value of IY is invalid.
IY1	I	IN	--	I	An integer variable that contains a lower limit for valid input years.
IY2	I	IN	--	I	An integer variable that contains an upper limit for valid input years.
INERR	I	I/O	--	I	An integer variable that contains an error count. QUITER increments INERR if IY is invalid.

SUBORDINATE MODULES:

QUITER

COMMON AREAS USED:

NONE

LOCAL VARIABLES:

NAME	TYPE	DIM	FMT	DESCRIPTION
II	I	--	I	A local variable used to store the calendar year.

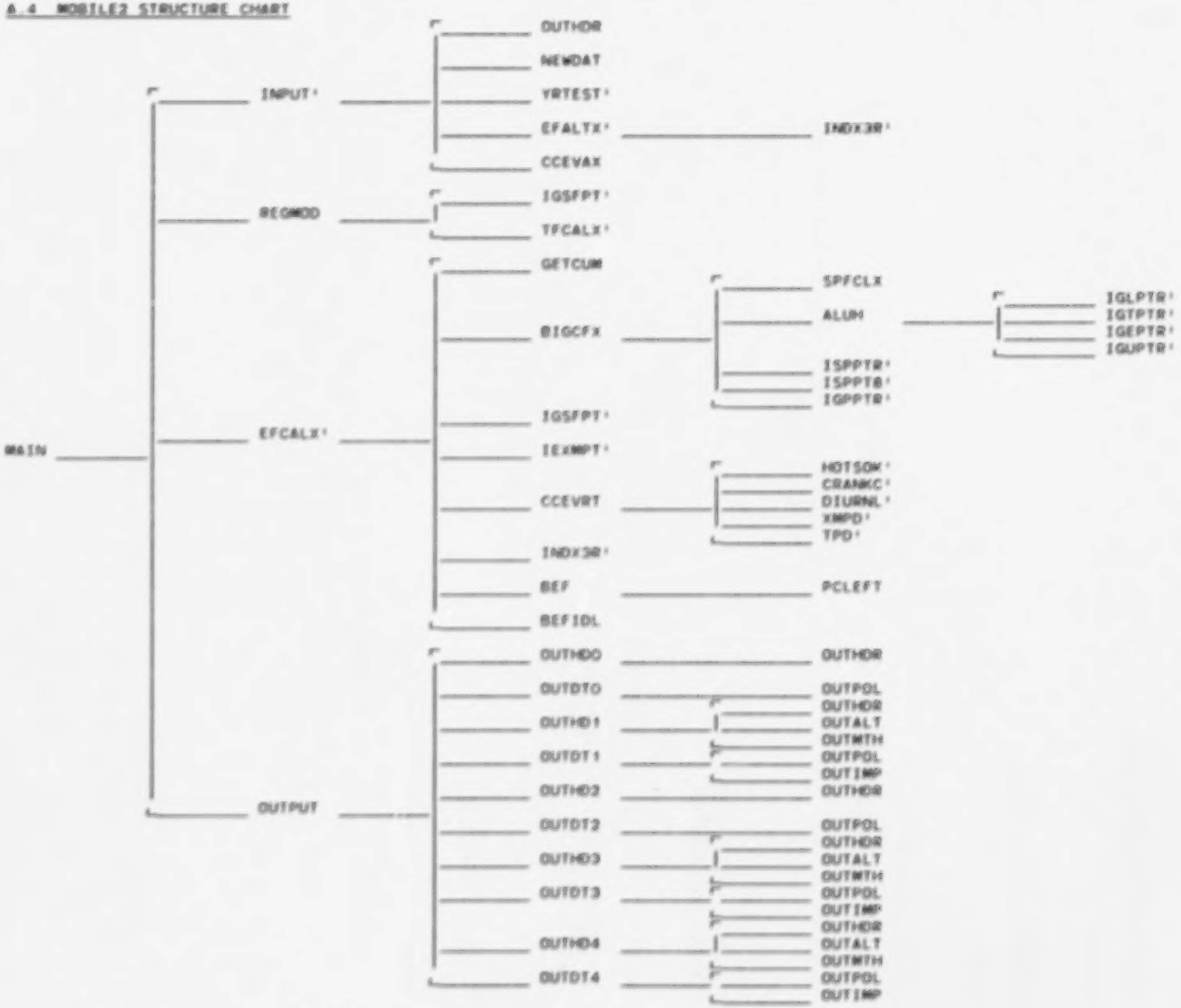
INPUT VARIABLES:

NAME	METHOD
IY,NERR,IY1, IY2,INERR	arguments

OUTPUT VARIABLES:

NAME	METHOD
IY,INERR	arguments

A.4 MOBILE2 STRUCTURE CHART


MAIN
INPUT*
OUTHDR
NEWDAT
YRTEST*
EFALTX*
INDX3R*
CCEVAX
REGMOD
IGSFPT*
TFCALX*
EFCALX*
GETCUM
BIGCFX
SPFCLX
ALUM
IGLPTR*
IGTPTR*
IGEPTR*
IGUPTR*
ISPPTR*
ISPPTB*
IGPPTR*
IGSFPT*
IEXMPT*
CCEVRT
HOTSOK*
CRANKC*
DIURNL*
XMPD*
TPD*
INDX3R*
BEF
PCLEFT
BEFIDL
OUTPUT
OUTHDO
OUTHDR
OUTDTO
OUTPOL
OUTHDR
OUTHD1
OUTALT
OUTMTH
OUTDT1
OUTPOL
OUTIMP
OUTHD2
OUTHDR
OUTDT2
OUTPOL
OUTHDR
OUTHD3
OUTALT
OUTMTH
OUTDT3
OUTPOL
OUTIMP
OUTHDR
OUTHD4
OUTALT
OUTMTH
OUTDT4
OUTPOL
OUTIMP

* THESE ROUTINES CONDITIONALLY CALL SUBROUTINE QUITER.

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The December 12, 1980 release of MOBILE2 contains 8,420 records.

The March 31, 1981 revision contains 8,452 records.

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OUTALT , SUBROUTINE	MOBILE2 (18000,18055)	B-53
OUTMTH , SUBROUTINE	MOBILE2 (19000,19051)	B-54
OUTPOL , SUBROUTINE	MOBILE2 (20000,20045)	B-55
OUTIMP , SUBROUTINE	MOBILE2 (21000,21066)	B-56
EFCALX , SUBROUTINE	MOBILE2 (24000,24173)	B-58
CCEVRT , FUNCTION	MOBILE2 (25000,25060)	B-61
HOTSOK , FUNCTION	MOBILE2 (26000,26042)	B-63
TPD , FUNCTION	MOBILE2 (27000,27042)	B-64
DIURNL , FUNCTION	MOBILE2 (28000,28042)	B-65
XMPD , FUNCTION	MOBILE2 (29000,29042)	B-66
CRANKC , FUNCTION	MOBILE2 (30000,30042)	B-67
BIGCFX , SUBROUTINE	MOBILE2 (31000,31180)	B-68
REGMOD , SUBROUTINE	MOBILE2 (32000,32109)	B-72
TFCALX , SUBROUTINE	MOBILE2 (33000,33065)	B-74
SPFCLX , SUBROUTINE	MOBILE2 (34000,34044)	B-76
BEF , FUNCTION	MOBILE2 (35000,35076)	B-77
BEFIDL , FUNCTION	MOBILE2 (36000,36072)	B-79
GETCUM , SUBROUTINE	MOBILE2 (37000,37037)	B-81
EFALTX , SUBROUTINE	MOBILE2 (38000,38062)	B-82
CCEVAX , SUBROUTINE	MOBILE2 (39000,39059)	B-84
PCLEFT , FUNCTION	MOBILE2 (40000,40135)	B-86
ALUH , SUBROUTINE	MOBILE2 (41000,41091)	B-89
IGEPTR , FUNCTION	MOBILE2 (42000,42043)	B-91
IGUPTR , FUNCTION	MOBILE2 (43000,43043)	B-92
IGLPTR , FUNCTION	MOBILE2 (44000,44043)	B-93
IGTPTR , FUNCTION	MOBILE2 (45000,45043)	B-94
IGPPTR , FUNCTION	MOBILE2 (46000,46043)	B-95
INDX3R , FUNCTION	MOBILE2 (47000,47049)	B-96
ISPPTR , FUNCTION	MOBILE2 (48000,48042)	B-97
ISPPT8 , FUNCTION	MOBILE2 (49000,49043)	B-98
IEXMPT , FUNCTION	MOBILE2 (50000,50042)	B-99
IGSFPT , FUNCTION	MOBILE2 (52000,52043)	B-100
BLOCK DATA 1	MOBILE2 (53000,53137)	B-101
BLOCK DATA 2	MOBILE2 (54000,54071)	B-104
BLOCK DATA 3	MOBILE2 (55000,55510)	B-106
BLOCK DATA 4	MOBILE2 (56000,56282)	B-115
BLOCK DATA 5	MOBILE2 (57000,57260)	B-120
BLOCK DATA 6	MOBILE2 (58000,58534)	B-125

BLOCK DATA 7 .... MOBILE2 (59000,59097) B-135
BLOCK DATA 8 .... MOBILE2 (60000,60099) B-137
BLOCK DATA 9 .... MOBILE2 (61000,61099) B-139
BLOCK DATA 10 .... MOBILE2 (62000,62099) B-141
BLOCK DATA 11 .... MOBILE2 (63000,63099) B-143
BLOCK DATA 12 .... MOBILE2 (64000,64099) B-145
BLOCK DATA 13 .... MOBILE2 (65000,65033) B-147
BLOCK DATA 14 .... MOBILE2 (66000,66306) B-148
BLOCK DATA 15 .... MOBILE2 (67000,67314) B-154
BLOCK DATA 16 .... MOBILE2 (68000,68153) B-160
BLOCK DATA 17 .... MOBILE2 (69000,69089) B-163
BLOCK DATA 18 .... MOBILE2 (70000,70216) B-165
BLOCK DATA 19 .... MOBILE2 (71000,71076) B-169
BLOCK DATA 20 .... MOBILE2 (73000,73198) B-171
BLOCK DATA 21 .... MOBILE2 (74000,74029) B-175

```
C..M1939.S
C
C                   ******* MOBILE2 *******          DECEMBER 12, 1980
C
C |                                                  REVISED MARCH 31, 1981
C |                                                  ----------------------
C
C    MOBILE2 IS A FORTRAN PROGRAM USED TO ESTIMATE THE  HC,  CO,  AND
C    NOX EMISSIONS BY MOTOR VEHICLES.  IT IS AN UPDATE TO THE MOBILE1
C    MOBILE  SOURCE  EMISSION  MODEL.  THIS  RELEASE  OF  MOBILE2
C    INCORPORATES THE LOW  ALTITUDE  CALIFORNIA,  LOW  ALTITUDE  NON-
C    CALIFORNIA,  AND  HIGH ALTITUDE NON-CALIFORNIA EMISSION FACTORS.
C    THE  LOW  ALTITUDE  NON-CALIFORNIA  I/M  CREDITS  ARE  INCLUDED.
C    DIFFERENT I/M CREDITS FOR THE OTHER REGIONS WILL BE AVAILABLE IN
C    A FEW WEEKS.
C
C    AT THE TIME OF THIS WRITING THE USER'S GUIDE FOR MOBILE2 WAS NOT
C    FINALIZED.  SINCE THE DRAFT MOBILE2 USER'S GUIDE IS NOT  READILY
C    AVAILABLE,  THE  MOBILE1  USER'S GUIDE CAN BE USED.  MOBILE2 WAS
C    DESIGNED  TO  BE  UPWARD  COMPATIBLE  WITH  MOBILE1  INPUTS  AND
C    OUTPUTS.   THEREFORE,  THE  MOBILE1  GUIDE  WILL GIVE SUFFICIENT
C    INFORMATION TO RUN MOBILE2.  HOWEVER, MOBILE2 DOES HAVE SOME NEW
C    OPTIONS NOT EXPLAINED IN THE MOBILE1 USER'S GUIDE.
C
C    A SHORT LIST OF DIFFERENCES BETWEEN MOBILE1 AND MOBILE2  FOLLOWS
C    AT  THE  END OF THIS PARAGRAPH.  A MORE COMPLETE LIST WILL BE IN
C    THE MOBILE2 USER'S GUIDE.  THE GUIDE WILL ALSO INCLUDE A SET  OF
C    EXAMPLE  INPUT  DATA  SETS  THAT  WILL  TEST  THE OPTIONS OF THE
C    MOBILE2 PROGRAM.  SOME OF THE DIFFERENCES  BETWEEN  MOBILE1  AND
C    MOBILE2 ARE AS FOLLOWS:
C
C    -   MOBILE2 HAS TWO NEW VEHICLE TYPES; LIGHT DUTY DIESEL POWERED
C        VEHICLES AND LIGHT DUTY DIESEL POWERED TRUCKS.
C
C    -   MOBILE2 CAN GIVE RESULTS FOR A COMBINED LDGT GROUP.
C
C    -   MOBILE2  GIVES  THE  USER THE OPTION OF ENTERING ALTERNATIVE
C        VALUES FOR I/M CREDITS.
C
C    -   MOBILE2 ALLOWS THE USER TO ENTER THE AVERAGE NUMBER OF TRIPS
C        PER DAY AND AVERAGE MILES TRAVELED PER DAY FOR EACH  VEHICLE
C        TYPE.
C
C    -   MOBILE2  USERS  CAN  ENTER  UP  TO  15  ALTERNATIVE EMISSION
C        EQUATIONS (MODEL YEAR GROUPS) FOR EACH UNIQUE COMBINATION OF
C        VEHICLE TYPE, REGION, AND POLLUTANT.  MOBILE1  ALLOWED  ONLY
C        10.
C
C    -   THE UPPER LIMIT FOR MODEL AND CALENDAR YEARS HAS BEEN RAISED
C        FROM 1995 IN MOBILE1 TO 2020 IN MOBILE2.
C
C    -   MOBILE2  DOES  NOT  HAVE  THE UNFORMATTED OUTPUT OPTION THAT
C        MOBILE1 HAD.  HOWEVER,  A  VALUE  FOR  THE  OPTION'S  FLAG,
C        'UNFFLG',  IS  STILL  REQUIRED  TO  RETAIN THE MOBILE1 INPUT
C        SEQUENCE.
C
C    -   MOBILE2 NOW PRINTS WARNING AND ERROR  MESSAGES.   UP  TO  50
C        ERROR MESSAGES MAY BE PRINTED FOR ANY ONE RUN.
```

```
C
C
C    ON 12-12-80, A NEW RELEASE OF MOBILE2 WAS FINALIZED. THE
C    12-12-80 RELEASE OF MOBILE2 DIFFERS FROM THE PREVIOUS
C    RELEASE (10-30-80) IN TWO MAJOR WAYS: (A) THE INCLUSION OF
C    HIGH ALTITUDE AND CALIFORNIA DATA IN THE BLOCK DATA
C    ROUTINES, AND (B) THE INCLUSION OF I/M CREDITS. THE 10-30-
C    80 RELEASE CONTAINED ZEROES FOR ALL HIGH ALTITUDE AND
C    CALIFORNIA RELATED VARIABLES, AND ALSO CONTAINED ZEROES IN
C    THE I/M CREDIT ARRAYS. THERE WERE OTHER MINOR CHANGES.
C    BECAUSE OF THE QUANTITY OF CHANGES, IT IS RECOMMENDED THAT
C    USERS REPLACE THE ENTIRE PROGRAM RATHER THAN ONLY THOSE
C    ROUTINES THAT WERE CHANGED. IN THE FOLLOWING LIST OF
C    CHANGES, LINES FLAGGED WITH AN ASTERIK (*) REPRESENT ACTUAL
C    LINES OF FORTRAN CODE.
C
C    A COMPLETE LIST OF DIFFERENCES FOLLOWS:
C
C    1. THE FOLLOWING BLOCK DATAS HAD HIGH ALTITUDE AND
C       CALIFORNIA DATA ADDED:
C       -  BLOCK DATA 3 (MODEL YEAR GROUPS FOR FTP AND IDLE
C          EMISSION RATES).
C       -  BLOCK DATA 4 (FTP EMISSION RATES).
C       -  BLOCK DATA 5 (IDLE EMISSION RATES).
C       -  BLOCK DATA 7 (NON-METHANE FRACTION OF TOTAL HC, AND
C          MODEL YEAR GROUPS FOR NON-METHANE FRACTION).
C       -  BLOCK DATA 8 (HOT SOAK HC EMISSION RATES, AND MODEL YEAR
C          GROUPS FOR THESE RATES).
C       -  BLOCK DATA 9 (TRIPS/DAY, AND MODEL YEAR GROUPS FOR
C          TRIPS/DAY).
C       -  BLOCK DATA 10 (DIURNAL HC EMISSION RATES, AND MODEL YEAR
C          GROUPS FOR THESE RATES).
C       -  BLOCK DATA 11 (MILES/DAY, AND MODEL YEAR GROUPS FOR
C          MILES/DAY).
C       -  BLOCK DATA 12 (CRANKCASE HC EMISSION RATES, AND MODEL
C          YEAR GROUPS FOR THESE RATES).
C       -  BLOCK DATA 16 (MODEL YEAR GROUPS FOR TEMPERATURE
C          CORRECTION FACTOR COEFFICIENTS AND NORMALIZED BAG
C          FRACTION COEFFICIENTS).
C       -  BLOCK DATA 17 (MODEL YEAR GROUPS FOR SPEED CORRECTION
C          FACTOR COEFFICIENTS).
C       -  BLOCK DATA 18 (FRACTION OF VEHICLES EQUIPPED WITH A/C;
C           A/C CORRECTION FACTORS; EXTRA LOAD CORRECTION FACTORS;
C           AND TRAILER TOWING CORRECTION FACTORS).
C       -  BLOCK DATA 19 (MODEL YEAR GROUPS FOR THE ITEMS IN BLOCK
C          DATA 18).
C       -  BLOCK DATA 20 (DIESELIZATION SALES RATES AND MODEL YEAR
C          GROUPS FOR THESE RATES).
C
C
C    2. VALUES FOR I/M CREDITS WERE ADDED TO BLOCK DATA 6
C       (COMMON/IMCRED/), REPLACING THE ZERO VALUES OF THE
C       10-30-80 RELEASE.
C
C    3. CHANGES FOR HANDLING USER-SUPPLIED I/M CREDITS WERE MADE
C       TO ROUTINES INPUT, NEWDAT, AND QUITER. THE CHANGES WERE
C       TO ALLOW THE NUDATA FLAG TO ASSUME VALUES OF 0, 1, 2, OR
C       3. THE 10-30-80 RELEASE ALLOWED NUDATA TO ASSUME THE
```

```
C       VALUES 0 OR 1.  THIS CHANGE PROVIDES THE CAPABILITY   OF
C       READING IN ALTERNATIVE TECHNOLOGY IV I/M CREDITS.  THE
C       SPECIFIC LINES OF CODE CHANGED ARE LISTED BELOW.
C
C        (A)  IN ROUTINE INPUT,THE STATEMENTS (BETWEEN STMT#1595 &#1600):
C
C*      IF(NUDATA.LT.0.OR.NUDATA.GT.1) CALL QUITER(0.,NUDATA,74,INERR)
C*      IF(NUDATA.EQ.1) CALL NEWDAT(IRDFLG)
C
C       WERE REPLACED BY:
C
C*      IF(NUDATA.LT.0.OR.NUDATA.GT.3) CALL QUITER(0.,NUDATA,74,INERR)
C*      IF(NUDATA.GT.0) CALL NEWDAT(IRDFLG)
C
C        (B)  IN ROUTINE NEWDAT, THE STATEMENT:
C
C*  400 DO 500 IP=1,2
C
C       WAS REPLACED BY:
C
C*  400 IF(NUDATA.EQ.2) GO TO 700
C*      DO 500 IP=1,2
C
C        (C)  IN ROUTINE NEWDAT, THE STATEMENT (FOLLOWING STMT#600) :
C
C*      GOTO 999
C
C       WAS REPLACED BY:
C
C*      IF(NUDATA.EQ.1) GO TO 999
C*  700 DO 800 ISTRN=1,5
C*      DO 800 AGEIST=1,20
C*  800 READ(IOUIMD,600,END=888,ERR=888)
C*     *   (ITECH4(BY,AGEIST,ISTRN),BY=1,19)
C*      GOTO 999
C
C        (D)  IN ROUTINE QUITER, THE STATEMENT:
C
C* 7410 FORMAT('+',10X,I4,5A4,'NEW DATA FLAG (0 TO 1)')
C
C       WAS REPLACED BY:
C
C* 7410 FORMAT('+',10X,I4,5A4,'NEW DATA FLAG (0 TO 3)')
C
C    4. THE  CALCULATION  OF EVALUATED ALTITUDE HAS BEEN REMOVED
C       FROM ROUTINE EFCALX.  THIS  OPTION  IS  EXPECTED  TO  BE
C       ADDED  AGAIN  AFTER  A  REDEFINITION  OF  THE  EVALUATED
C       ALTITUDE METHODOLOGY.  SPECIFICALLY:
C
C       IN ROUTINE EFCALX, THE STATEMENTS:
C
C*C  THE COMPOSITE EMISSION CALCULATION REQUIRES AN INTERPOLATION
C*C  BETWEEN TWO REGIONS FOR HIGH AND LOW ALTITUDE.
C*C
C*C  ROUND THE ALTITUDE TO THE NEAREST 500 FEET AND
C*C  DETERMINE AN ALTITUDE ADJUSTMENT TERM.
C* 30   IALT=ALT
C*      IALT=((IALT+250)/500)*500
```

```
C*      RALT=IALT
C*      ATERM=(RALT-500.)/5000.
C*C
C*C..IF ANY HI OR LO EMISSION IS NON-POSITIVE, RESULT IS ZERO.
C*C
C*      IF(IP.NE.1) GOTO 340
C*C
C*C.. CRANKCASE EMISSION (HC ONLY)
C*C
C*      CMPCC1=CCEVRT(MY,IV,1)
C*      CMPCC2=CCEVRT(MY,IV,3)
C*      IF(CMPCC1.GT.0..AND.CMPCC2.GT.0.)
C*     *   COMPCC=((CMPCC2-CMPCC1)*ATERM+CMPCC1)*TF(IDX,IV)
C*C
C*C..COMPOSITE EMISSIONS
C*C
C*  340 INDX1=INDX3R(MY,IP,IV,1)
C*      INDX3=INDX3R(MY,IP,IV,3)
C*      CMPEF1=BEF(MY,ICY,INDX1,IP,IV,1,VMTAGE,EXMVAL)*
C*     -   CFRET(IDX,IP,IV,1)
C*      CMPEF2=BEF(MY,ICY,INDX3,IP,IV,3,VMTAGE,EXMVAL)*
C*     -   CFRET(IDX,IP,IV,2)
C*      IF(CMPEF1.GT.0..AND.CMPEF2.GT.0.)
C*     *   COMPEF=((CMPEF2-CMPEF1)*ATERM+CMPEF1)*TF(IDX,IV)+COMPCC
C*C
C*C..IDLE EMISSIONS
C*C
C*      IDLFC1=BEFIDL(INDX1,IP,IV,1,VMTAGE,EXMVAL)
C*      IDLFC2=BEFIDL(INDX3,IP,IV,3,VMTAGE,EXMVAL)
C*      IF(IDLFC1.GT.0..AND.IDLFC2.GT.0.)
C*     *   IDLFAC=((IDLFC2-IDLFC1)*ATERM+IDLFC1)*TF(IDX,IV)
C
C       WERE REPLACED BY:
C
C*  330 CONTINUE
C*C.. ONCE THE EVALUATED ALTITUDE METHODOLOGY IS FINALIZED,
C*C.. THE PROCEDURE WILL BE PUT HERE
C
C    5. A KEYPUNCHING ERROR  WAS  CORRECTED  IN  BLOCK  DATA  4.
C       (COMMON/BASECM/) THE VALUE "4.53" FOR LOW ALTITUDE LDGT1
C       1968-1972  FTP  ZERO  MILE EXHAUST RATE WAS CORRECTED TO
C       "4.35", MATCHING THE LDGV EMISSION RATE FOR THE  SIMILAR
C       CATEGORY.
C
C       THE LAST LINE OF THE GROUP OF STATEMENTS:
C
C*C.. ZERO MILE (BASE) RATES
C*C.. LOW ALT. 49-STATE
C*C
C*      DATA B41/
C*C.. LDGV
C*     * 7.25, 4.43, 3.00, 3.36, 1.29, 0.29, 0.39, 0.39,7*0.0,
C*     *78.27,56.34,42.17,40.78,20.16, 6.14, 5.60, 5.21, 5.00,6*0.0,
C*     * 3.44, 4.35, 2.87, 2.43, 1.69, 1.56, 0.75,8*0.0,
C*C.. LDGT1
C*     * 7.25, 4.43, 3.00, 3.36, 1.84, 0.99, 0.89, 0.88,0.58,0.41,5*0.0,
C*     *78.27,56.34,42.17,40.78,24.91,13.92,11.85,11.44,6.14,3.01,5*0.0,
C*     * 3.44, 4.53, 2.87, 2.95, 1.85, 1.90, 1.42, 0.59,7*0.0,
C
C        WAS CHANGED TO:
C
C*     * 3.44, 4.35, 2.87, 2.95, 1.85, 1.90, 1.42, 0.59,7*0.0,
C
C    6.  A KEYPUNCHING ERROR WAS CORRECTED IN A DATA STATEMENT IN
C        ROUTINE  INPUT.   THE  STRING  "LDGG2"  WAS CORRECTED TO
C        "LDGT2" IN THE INITIALIZATION OF THE NAMMMR ARRAY.
C
C        THE LAST LINE OF THE GROUP OF STATEMENTS:
C
C*      DATA NAMMMR/
C*     *   '1-10',' FOR',' LDG','V:  ',
C*     *   '11-2','O FO','R LD','GV: ',
C*     *   '1-10',' FOR',' LDG','T1: ',
C*     *   '11-2','O FO','R LD','GT1:',
C*     *   '1-10',' FOR',' LDG','G2: ',
C
C        WAS CHANGED TO:
C
C*     *   '1-10',' FOR',' LDG','T2: ',
C
C    7.  IN ROUTINE INPUT, AN ",END=1940" PARAMETER WAS ADDED  TO
C        THE "READ(IOUGEN,1080) UNFFLG" STATEMENT.  (BETWEEN
C        STMT #1075 AND STMT#1080).
C
C    8.  THE DECLARATION STATEMENT "REAL IDLB3R,IDEL3R" WAS ADDED
C        TO MAIN TO SPECIFY THE INTENDED MODE OF THESE VARIABLES.
C
C    9.  THE  PREAMBLE  (COMMENT  STATEMENTS  AT  FRONT OF SOURCE
C        CODE) WAS UPDATED APPROPRIATELY.
C
C    10. THE  DEFAULT  IDENTIFICATION  RATE  FOR  TECHNOLOGY   IV
C        VEHICLES HAS BEEN ALTERED FROM 70 PERCENT TO 50 PERCENT.
C
C        (A)  IN ROUTINE INPUT, THE STATEMENT (BETWEEN STMT#1570 AND
C             STMT#1575):
C
C*      IOPTN=70
C
C        HAS BEEN CHANGED TO:
C
C*      IOPTN=50
C
C        (B)  IN ROUTINE OUTIMP, THE STATEMENTS:
C
C*  300 FORMAT(2X,'ATTENTION:THE DEFAULT VALUE OF 70% FOR TECHNOLOGY 4')
C*      IF(IOPTN.EQ.70) WRITE(IOUREP,320)
C*  320 FORMAT(4X,'I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.')
C*      IF(IOPTN.NE.70) WRITE(IOUREP,340)IOPTN
C
C        HAVE BEEN CHANGED TO:
C
C*  300 FORMAT(2X,'ATTENTION:THE DEFAULT VALUE OF 50% FOR TECHNOLOGY 4')
C*      IF(IOPTN.EQ.50) WRITE(IOUREP,320)
C*  320 FORMAT(4X,'I/M IDENTIFICATION RATE HAS BEEN LEFT UNCHANGED.')
C*      IF(IOPTN.NE.50) WRITE(IOUREP,340)IOPTN
C
```

```
C
C
C      ON 03-31-81, THE SPEED CORRECTION FACTOR METHODOLOGY  WAS
C      REVISED. THIS AFFECTED ONLY SUBROUTINE BIGCFX. THE MODIFIED
C      PROCEDURE GIVES MOBILE2 ADDITIONAL  FLEXIBILITY.  SPECIFIC
C      DETAILS ARE GIVEN IN APPENDIX C OF THE MOBILE2 USER'S GUIDE.
C
C
C
C       QUESTIONS CONCERNING THE PROGRAM SHOULD BE DIRECTED TO:
C
C            OFFICE OF MOBILE SOURCE AIR POLLUTION CONTROL
C            EMISSION CONTROL TECHNOLOGY DIVISION
C            TEST AND EVALUATION BRANCH
C            2565 PLYMOUTH ROAD
C            ANN ARBOR, MICH. 48105
C            TELEPHONE: 313-668-4365
C                       FTS 374-8365
C
C
C
        INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
        REAL IDLB3R,IDEL3R
C
        COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
        COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
        COMMON/REGCOM/IREJN,ALT
        COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
        COMMON/VMXCOM/VMTMIX(8)
        COMMON/ALTCOM/INTALT(5,100),R4ALT(2,100),MODFLG(100),NEWFAC
        COMMON/MYMSAV/SAVMYM(20,8),SAVMYR(20,8)
        COMMON/MYMCOM/XMYM(20,8),XMYR(20,8),TF(20,8),TFMYM(20,8)
        COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
        COMMON/PROJCM/PROJID(20)
        COMMON/IMCOM/ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2
        COMMON/IMCOM/ILDT,IOPTN,NUDATA,NLINES,STRING(18,9)
        COMMON/CEVCOM/USRTPD(8),USRMPD(8)
        COMMON/YEARS4/IY1951,IY1970,IY2020
        COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
        COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
        COMMON/IMCRED/IRED(19,20,5,2,2),ITECH4(19,20,5)
        COMMON/ALTEQU/MAXEQU
        COMMON/CUMCOM/CUMMIL(20,8)
        COMMON/HOTCOM/MAXHOT,HOTVAL(6,8,3),IHOTYS(6,8,3)
        COMMON/TPDCOM/MAXTPD,TPDVAL(2,8,3),ITPDYS(2,8,3)
        COMMON/DIUCOM/MAXDIU,DIUVAL(6,8,3),IDIUYS(6,8,3)
        COMMON/XMPCOM/MAXXMP,XMPVAL(2,8,3),IXMPYS(2,8,3)
        COMMON/CRACOM/MAXCRA,CRAVAL(3,8,3),ICRAYS(3,8,3)
        COMMON/RET1/ALHRET(20,4,3)
        COMMON/IVPCOM/IVPTRG(8),IVPTRT(8),IVPTRA(8),IVPTRB(8)
        COMMON/TCFCOM/TTACOF(2,3,9,3,6),TT4COF(2,9,3),TT7COF(2,3)
        COMMON/GPCCOM/GPACOF(8,9,3,6),GPBCOF(3,3,3,4)
        COMMON/ACOM/AIN(6,18,3)
        COMMON/BASECM/BASE3R(15,3,8,3)
        COMMON/DELCOM/DEL3R(15,3,8,3)
        COMMON/BEFGCM/EXMETH(3,8,3),IEXMYR(3,8,3)
        COMMON/IDLBCM/IDLB3R(15,3,8,3)
        COMMON/IDLDCM/IDEL3R(15,3,8,3)
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      COMMON/INDXCM/INDXYR(15,2,3,8,3)
      COMMON/ALUCOM/ACEQIP(8,3,3),ACCF(2,3,2,3,3)
      COMMON/ALUCOM/XLCF(3,6,3,3),TWCF(3,6,3,3)
      COMMON/ALUPTR/IGEYRS(8,3,3),IGUYRS(2,3,3)
      COMMON/ALUPTR/IGLYRS(6,3,3),IGTYRS(6,3,3)
      COMMON/PTRCOM/MAXIGP,IGPYRS(9,3,3,8)
      COMMON/ISPCOM/ISPYRS(18,3,3),ISPYR8(18,3,3)
      COMMON/GSFCOM/MAXGSF,GSF(18,8,3),IGSFYR(18,8,3)
      COMMON/REGSUM/SUM1(8)
C
      REAL EFRETM(3;9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
C
C
C
      INERR=0
      IRDFLG=1
      ICYOLD=-1
      IROLD=-1
      ALTOLD=-1.
      INITFL=1
      CALL INPUT(INITFL,ICY,INERR)
      IF(IRDFLG.EQ.0) GOTO 999
      INITFL=0
C
C
C
  100 CALL INPUT(INITFL,ICY,INERR)
C
      IF(IRDFLG.EQ.0) GOTO 999
C..LIMIT ERROR DIAGNOSTICS WITH NEXT LINE.   G.J.H.
  200 IF(INERR.GT.50) GOTO 888
      IF(INERR.GT.0) GOTO 100
C
      IF(ICYOLD.NE.ICY.OR.IROLD.NE.IREJN.OR.ALTOLD.NE.ALT)
     *   CALL REGMOD(ICY,INERR)
      IF(INERR.GT.0) GOTO 200
      ICYOLD=ICY
      IROLD=IREJN
      ALTOLD=ALT
C
      CALL EFCALX(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD,INERR)
      IF(INERR.GT.0) GOTO 200
C
      CALL OUTPUT(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
      GOTO 100
C
C
C
  888 WRITE(IOUERR,889)
  889 FORMAT(/,' EXCESS DATA ERRORS PREVENT FURTHER ANALYSIS.')
C
  999 STOP
      END
      SUBROUTINE INPUT(INITFL,ICY,INERR)
C
C
C..PURPOSE:
C
C..SPROG READS AND VALIDATES UNIT IOUGEN DATA FOR ALL INPUT MODES.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..INITFL  I/O     INITIALIZATION FLAG (1=INIT, 0=INIT DONE)
C..ICY     I/O     CALENDAR YEAR (2-DIGIT IN, 4-DIGIT OUT)
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..QUITER
C..NEWDAT
C..YRTEST
C..EFALTX
C..CCEVAX
C..OUTHDR
C
C
C..USED BY:
C
C..MAIN
C
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/ALTCOM/INTALT(5,100),R4ALT(2,100),MODFLG(100),NEWFAC
      COMMON/MYMSAV/SAVMYM(20,8),SAVMYR(20,8)
      COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
      COMMON/PROJCM/PROJID(20)
      COMMON/IMCOM/ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2
      COMMON/IMCOM/ILDT,IOPTN,NUDATA,NLINES,STRING(18,9)
      COMMON/CEVCOM/USRTPD(8),USRMPD(8)
      COMMON/YEARS4/IY1951,IY1970,IY2020
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      INTEGER TRKFLG,UNFFLG
      DIMENSION NAMMMR(4,2,8),IOUREF(9),IOUOLD(4),IOUNEW(4)
C
      EQUIVALENCE
     *    (IOUOLD(1),IOUREP),
     *    (IOUOLD(2),IOUERR),
     *    (IOUOLD(3),IOUASK),
     *   (IOUOLD(4),IOUUNF)
C
      DATA IOUREF/
     *   '1   ',
     *   '2   ',
     *   '3   ',
     *   '4   ',
     *   '5   ',
     *   '6   ',
     *   '7   ',
     *   '8   ',
     *   '9   '/
C
      DATA NAMMMR/
     *   '1-10',' FOR',' LDG','V:  ',
     *   '11-2','O FO','R LD','GV: ',
     *   '1-10',' FOR',' LDG','T1: ',
     *   '11-2','O FO','R LD','GT1:',
     *   '1-10',' FOR',' LDG','T2: ',
     *   '11-2','O FO','R LD','GT2:',
     *   '1-10',' FOR',' HDG','V:  ',
     *   '11-2','O FO','R HD','GV: ',
     *   '1-10',' FOR',' LDD','V:  ',
     *   '11-2','O FO','R LD','DV: ',
     *   '1-10',' FOR',' LDD','T:  ',
     *   '11-2','O FO','R LD','DT: ',
     *   '1-10',' FOR',' HDD','V:  ',
     *   '11-2','O FO','R HD','DV: ',
     *   '1-10',' FOR',' MC:','    ',
     *   '11-2','O FO','R MC',':   '/
C
C
C..SKIP THIS STUFF EXCEPT DURING FIRST SUBR. CALL
      IF(INITFL.EQ.0) GOTO 1660
      INITFL=0
C
C..READ IN PROMPT/MODE/UNITS, TITLE, FLAGS, AND MYM-MYR
C
      READ(IOUGEN,1001,END=1940) IPROMT,IOUNEW
 1001 FORMAT(I1,4A1)
C
C..OUTPUT UNIT NUMBERS PARSED HERE
C
C..CHANGE ALPHANUMERIC TO NUMERIC VALUES
      DO 1010 I=1,4
C..TEST FOR ALLOWED VALUES (NO INPUT UNITS)
      DO 1005 J=1,9
      IF(J.EQ.IOUIMD.OR.J.EQ.IOUGEN) GOTO 1005
      JUNIT=J
      IF(IOUNEW(I).EQ.IOUREF(J)) GOTO 1010
 1005 CONTINUE
C..SET DEFAULT FOR UNRECOGNIZED VALUE
      JUNIT=0
 1010 IOUNEW(I)=JUNIT
C
C..RESOLVE CONFLICTS (FORMATTED VRS. UNFORMATTED)
C
C..CHECK TO ZERO UNFORMATTED UNIT IF EQUAL TO FORMATTED UNIT
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```
      IF(IOUNEW(4).EQ.0) GOTO 1030
      DO 1020 I=1,3
 1020 IF(IOUNEW(4).EQ.IOUNEW(I)) IOUNEW(4)=0
C
C..CHECK TO ZERO UNFORMATTED UNIT IF CLASH WITH DEFAULTS
      IF(IOUNEW(4).EQ.0) GOTO 1030
      DO 1025 I=1,3
 1025 IF(IOUNEW(4).EQ.IOUOLD(I).AND.
     *   IOUOLD(4).NE.IOUNEW(I).AND.
     *   IOUNEW(I).EQ.0) IOUNEW(4)=0
C
C..CHECK TO ZERO FORMATTED UNIT IF CLASH WITH DEFAULTS
      IF(IOUNEW(4).GT.0) GOTO 1040
 1030 DO 1035 I=1,3
 1035 IF(IOUOLD(4).EQ.IOUNEW(I)) IOUNEW(I)=0
C
C..ASSIGN OUTPUT UNITS
C
 1040 IOUSUM=0
      DO 1045 I=1,4
      IOUSUM=IOUNEW(I)+IOUSUM
 1045 IF(IOUNEW(I).GT.0) IOUOLD(I)=IOUNEW(I)
C
C..PARSE PROMPT/MODE FLAG HERE
C
C..SAVE INPUT FLAG FOR FUTURE POSSIBLE ABORT
      IPRSAV=IPROMT
      IF(IPROMT.GE.0.AND.IPROMT.LE.3) GOTO 1050
C
C..ABORT WILL HAPPEN DUE TO MODE/PROMPT FLAG ERROR
C..COLLECT TITLE FOR ID OF POSSIBLE MULTIPLE UNITS
      IPROMT=0
      WRITE(IOUASK,1060)
      READ(IOUGEN,1070,END=1940) PROJID
      GOTO 1075
C
C..PARSE PROMPT/MODE FLAG
C
 1050 IPROMT=IPROMT+1
      GOTO (1051,1052,1053,1054),IPROMT
 1051 IPROMT=0
      MDEFLG=1
      GOTO 1059
 1052 IPROMT=1
      MDEFLG=1
      GOTO 1059
 1053 IPROMT=0
      MDEFLG=2
      GOTO 1059
 1054 IPROMT=1
      MDEFLG=2
C
C..READ TITLE
C
 1059 IF(IPROMT.EQ.1) WRITE(IOUASK,1060)
 1060 FORMAT('0ENTER PROJECT ID:')
      READ(IOUGEN,1070,END=1940) PROJID
 1070 FORMAT(20A4)
```

```
C
C..WRITE TITLE TO DISTINCT ERROR/PROMPT UNITS
C
 1075 IF(IOUREP.NE.IOUERR) CALL OUTHDR(IOUERR)
C..DISPLAY UNIT NUMBER VALUES IF CHANGED
      IF(IOUSUM.GT.0) CALL QUITER(0.,0,71,INERR)
      IF(IPROMT.EQ.1.AND.IOUASK.NE.IOUREP.AND.IOUASK.NE.IOUERR)
     *   CALL OUTHDR(IOUASK)
      INITPR=1
C
C..TEST IPROMT/IPRSAV FOR FATAL ERROR
      IF(IPRSAV.LT.0.OR.IPRSAV.GT.3) CALL QUITER(0.,IPRSAV,2,INERR)
C
      IF(MDEFLG.EQ.2) GOTO 1230
C
      IF(IPROMT.EQ.1) WRITE(IOUASK,1190)
      READ(IOUGEN,1080,END=1940) INFLAG
      IF(INFLAG.LT.0.OR.INFLAG.GT.1) CALL QUITER(0.,INFLAG,3,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1130)
      READ(IOUGEN,1080,END=1940) SPDFLG
      IF(SPDFLG.NE.0.AND.SPDFLG.NE.2) CALL QUITER(0.,SPDFLG,4,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1090)
      READ(IOUGEN,1080,END=1940) VMFLAG
      IF(VMFLAG.LT.0.OR.VMFLAG.GT.2) CALL QUITER(0.,VMFLAG,5,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1170)
      READ(IOUGEN,1080,END=1940) MYMRFG
      IF(MYMRFG.LT.0.OR.MYMRFG.GT.3) CALL QUITER(0.,MYMRFG,6,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1100)
      READ(IOUGEN,1080,END=1940) ALTFLG
      IF(ALTFLG.LT.0.OR.ALTFLG.GT.1) CALL QUITER(0.,ALTFLG,7,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1180)
      READ(IOUGEN,1080,END=1940) IMFLG
      IF(IMFLG.LT.0.OR.IMFLG.GT.2) CALL QUITER(0.,IMFLG,8,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1110)
      READ(IOUGEN,1080,END=1940) ALHFLG
      IF(ALHFLG.LT.0.OR.ALHFLG.GT.2) CALL QUITER(0.,ALHFLG,9,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1120)
      READ(IOUGEN,1080,END=1940) TRKFLG
      IF(TRKFLG.NE.0) CALL QUITER(0.,TRKFLG,10,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1220)
      READ(IOUGEN,1080,END=1940) IFORM
      IF(IFORM.LT.0.OR.IFORM.GT.4) CALL QUITER(0.,IFORM,11,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1210)
      READ(IOUGEN,1080,END=1940) PRTFLG
      IF(PRTFLG.LT.0.OR.PRTFLG.GT.3) CALL QUITER(0.,PRTFLG,12,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1200)
      READ(IOUGEN,1080,END=1940) ICEVFG
      IF(ICEVFG.LT.0.OR.ICEVFG.GT.3) CALL QUITER(0.,ICEVFG,13,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1150)
      READ(IOUGEN,1080,END=1940) IDLFLG
      IF(IDLFLG.LT.0.OR.IDLFLG.GT.1) CALL QUITER(0.,IDLFLG,14,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1140)
      READ(IOUGEN,1080,END=1940) NMHFLG
      IF(NMHFLG.LT.0.OR.NMHFLG.GT.1) CALL QUITER(0.,NMHFLG,15,INERR)
      IF(IPROMT.EQ.1) WRITE(IOUASK,1160)
      READ(IOUGEN,1080,END=1940) UNFFLG
      IF(UNFFLG.NE.0) CALL QUITER(0.,0,50,INERR)
C
```

```
 1080 FORMAT(I1)
 1090 FORMAT(' ENTER VMFLAG:')
 1100 FORMAT(' ENTER ALTFLG:')
 1110 FORMAT(' ENTER ALHFLG:')
 1120 FORMAT(' ENTER TRKFLG:')
 1130 FORMAT(' ENTER SPDFLG:')
 1140 FORMAT(' ENTER NMHFLG:')
 1150 FORMAT(' ENTER IDLFLG:')
 1160 FORMAT(' ENTER UNFFLG:')
 1170 FORMAT(' ENTER MYMRFG:')
 1180 FORMAT(' ENTER IMFLG:')
 1190 FORMAT(' ENTER INFLAG:')
 1200 FORMAT(' ENTER ICEVFG:')
 1210 FORMAT(' ENTER PRTFLG:')
 1220 FORMAT(' ENTER IFORM:')
C
      GOTO1250
C..READ FLAGS FOR MODE 2
 1230 IF(IPROMT.EQ.1) WRITE(IOUASK,1235)
 1235 FORMAT(' ENTER INFLAG, SPDFLG, VMFLAG, MYMRFG, ALTFLG, IMFLG,'
     *,' ALHFLG,'/' TRKFLG, IFORM, PRTFLG, ICEVFG, IDLFLG, NMHFLG, &'
     *, ' UNFFLG')
      READ(IOUGEN,1240,END=1940) INFLAG,SPDFLG,VMFLAG,MYMRFG,ALTFLG,
     *     IMFLG,ALHFLG,TRKFLG,IFORM,PRTFLG,ICEVFG,IDLFLG,NMHFLG,UNFFLG
 1240 FORMAT(I1,13(1X,I1))
      IF(IPROMT.LT.0.OR.IPROMT.GT.1) CALL QUITER(0.,IPROMT,2,INERR)
      IF(INFLAG.LT.0.OR.INFLAG.GT.1) CALL QUITER(0.,INFLAG,3,INERR)
      IF(SPDFLG.NE.0.AND.SPDFLG.NE.2) CALL QUITER(0.,SPDFLG,4,INERR)
      IF(VMFLAG.LT.0.OR.VMFLAG.GT.2) CALL QUITER(0.,VMFLAG,5,INERR)
      IF(MYMRFG.LT.0.OR.MYMRFG.GT.3) CALL QUITER(0.,MYMRFG,6,INERR)
      IF(ALTFLG.LT.0.OR.ALTFLG.GT.1) CALL QUITER(0.,ALTFLG,7,INERR)
      IF(IMFLG.LT.0.OR.IMFLG.GT.2) CALL QUITER(0.,IMFLG,8,INERR)
      IF(ALHFLG.LT.0.OR.ALHFLG.GT.2) CALL QUITER(0.,ALHFLG,9,INERR)
      IF(TRKFLG.NE.0) CALL QUITER(0.,TRKFLG,10,INERR)
      IF(IFORM.LT.0.OR.IFORM.GT.4) CALL QUITER(0.,IFORM,11,INERR)
      IF(PRTFLG.LT.0.OR.PRTFLG.GT.3) CALL QUITER(0.,PRTFLG,12,INERR)
      IF(ICEVFG.LT.0.OR.ICEVFG.GT.3) CALL QUITER(0.,ICEVFG,13,INERR)
      IF(IDLFLG.LT.0.OR.IDLFLG.GT.1) CALL QUITER(0.,IDLFLG,14,INERR)
      IF(NMHFLG.LT.0.OR.NMHFLG.GT.1) CALL QUITER(0.,NMHFLG,15,INERR)
      IF(UNFFLG.NE.0) CALL QUITER(0.,0,50,INERR)
 1250 CONTINUE
C
      IF(INERR.GT.0) CALL QUITER(0.,0,53,INERR)
      IF(VMFLAG.EQ.2.AND.IPROMT.EQ.1) WRITE(IOUASK,1790)
      IF(VMFLAG.EQ.2.AND.INFLAG.EQ.0) READ(IOUGEN,1820,END=1940) VMTMIX
      IF(VMFLAG.EQ.2.AND.INFLAG.EQ.1) READ(IOUGEN,1820,END=1940) VMTMIX
      IF(VMFLAG.NE.2) GOTO 1270
      X=0.
      DO 1260 IV=1,MAXVEH
      X=VMTMIX(IV)+X
      IF(VMTMIX(IV).LT.0..OR.VMTMIX(IV).GT.1.)
     *     CALL QUITER(VMTMIX(IV),0,17,INERR)
 1260 CONTINUE
      IF(X+1.E-6.LT.1..OR.X-1.E-6.GT.1.) CALL QUITER(X,0,18,INERR)
C
 1270 IF(MYMRFG.NE.1.AND.MYMRFG.NE.3) GOTO 1350
      IF(IPROMT.EQ.1) WRITE(IOUASK,1280)
 1280 FORMAT(/)
```

```
C
C
      DO 1320 IV=1,MAXVEH
C
      DO 1310 J=1,2
      IF(IPROMT.EQ.1) WRITE(IOUASK,1290)  (NAMMMR(I,J,IV),I=1,4)
 1290 FORMAT(' ENTER MYM AGES ',4A4)
      L=1
      M=10
      IF(J.EQ.1) GOTO 1300
      L=11
      M=20
 1300 READ(IOUGEN,1430,END=1940)  (SAVMYM(N,IV),N=L,M)
 1310 CONTINUE
 1320 CONTINUE
C
C
      DO 1340 IV=1,MAXVEH
C
      DO 1330 IDX=1,20
      IF(SAVMYM(IDX,IV).LT.0.) CALL QUITER(SAVMYM(IDX,IV),0,19,INERR)
 1330 CONTINUE
 1340 CONTINUE
 1350 IF(MYMRFG.NE.2.AND.MYMRFG.NE.3) GOTO 1440
      IF(IPROMT.EQ.1) WRITE(IOUASK,1280)
      DO 1400 IV=1,MAXVEH
      DO 1380 J=1,2
      IF(IPROMT.EQ.1) WRITE(IOUASK,1360)  (NAMMMR(I,J,IV),I=1,4)
 1360 FORMAT(' ENTER MYR AGES ',4A4)
      L=1
      M=10
      IF(J.EQ.1) GOTO 1370
      L=11
      M=20
 1370 READ(IOUGEN,1430,END=1940)  (SAVMYR(N,IV),N=L,M)
 1380 CONTINUE
      X=0.
      DO 1390 IDX=1,20
 1390 X=SAVMYR(IDX,IV)+X
      IF(X-.00001.GT.1..OR.X+.00001.LT.1.) CALL QUITER(X,0,49,INERR)
 1400 CONTINUE
C
C
      DO 1420 IV=1,MAXVEH
C
      DO 1410 IDX=1,20
      IF(SAVMYR(IDX,IV).LT.0.) CALL QUITER(SAVMYR(IDX,IV),0,20,INERR)
 1410 CONTINUE
 1420 CONTINUE
 1430 FORMAT(10F5.3)
C
C
 1440 IF(MYMRFG.EQ.0) GOTO 1490
C
C
      DO 1470 IV=1,MAXVEH
C
      DO 1460 IDX=1,20
      IF(SAVMYM(IDX,IV).GT.0.) GOTO 1450
      IF(SAVMYR(IDX,IV).GT.0.) CALL QUITER(SAVMYR(IDX,IV),0,21,INERR)
      GOTO 1460
 1450 IF(SAVMYR(IDX,IV).EQ.0.) CALL QUITER(SAVMYM(IDX,IV),0,22,INERR)
 1460 CONTINUE
 1470 CONTINUE
C
C..CHECK VEHICLE EQUALITIES (LDGV,LDDV), (LDGT1,LDDT) MOD YR REGS.
C
      DO 1480 IDX=1,20
      IF(SAVMYR(IDX,1).NE.SAVMYR(IDX,5)) CALL QUITER(0.,IDX,65,INERR)
      IF(SAVMYR(IDX,2).NE.SAVMYR(IDX,6)) CALL QUITER(0.,IDX,66,INERR)
 1480 CONTINUE
C
C..NORMALIZE SAVMYR
C
 1490 DO 1510 IV=1,MAXVEH
      SUM=0.
C
      DO 1500 IDX=1,20
 1500 SUM=SAVMYR(IDX,IV)+SUM
      IF(SUM.EQ.0.) SUM=1.
C
      DO 1510 IDX=1,20
 1510 SAVMYR(IDX,IV)=SAVMYR(IDX,IV)/SUM
C
C..HERE READ IN E.F. MODIFICATION DATA
      IF(ALTFLG.NE.1) GOTO 1565
      IF(IPROMT.EQ.1) WRITE(IOUASK,1520)
 1520 FORMAT('0ENTER NO. OF NEW E.F. INTERCEPT/SLOPE PAIRS (I2)')
      IF(INFLAG.EQ.0) READ(IOUGEN,1530,END=1940) NEWFAC
      IF(INFLAG.EQ.1) READ(IOUGEN,1530,END=1940) NEWFAC
 1530 FORMAT(I2)
      IF(NEWFAC.LT.1.OR.NEWFAC.GT.100) CALL QUITER(0.,NEWFAC,23,INERR)
C
      DO 1560 IFAC=1,NEWFAC
C
      IF(IPROMT.EQ.1) WRITE(IOUASK,1540)
 1540 FORMAT(' ENTER REGION,VEH. TYPE,POLLUTANT,FIRST MY,',
     * /' LAST MY,NEW INTERCEPT (A), AND NEW SLOPE (B)')
      IF(INFLAG.EQ.0) READ(IOUGEN,1550,END=1940) IRGALT,IMDALT,IPLALT,
     *  MYFRST,MYLAST,BASNEW,DELNEW
      IF(INFLAG.EQ.1) READ(IOUGEN,1550,END=1940) IRGALT,IMDALT,IPLALT,
     *  MYFRST,MYLAST,BASNEW,DELNEW
 1550 FORMAT(I1,1X,I1,1X,I1,1X,I2,1X,I2,1X,F6.2,1X,F6.2)
      IF(IRGALT.NE.1.AND.IRGALT.NE.2.AND.IRGALT.NE.3)
     *   CALL QUITER(0.,IRGALT,62,INERR)
      IF(IMDALT.LT.1.OR.IMDALT.GT.8) CALL QUITER(0.,IMDALT,25,INERR)
      IF(IPLALT.LT.1.OR.IPLALT.GT.3) CALL QUITER(0.,IPLALT,26,INERR)
      CALL YRTEST(MYFRST,27,IY1951,IY2020,INERR)
      CALL YRTEST(MYLAST,28,IY1951,IY2020,INERR)
      IF(MYLAST.LT.MYFRST) CALL QUITER(0.,0,29,INERR)
      IF(BASNEW.LE.0.) CALL QUITER(BASNEW,0,30,INERR)
      IF(DELNEW.LT.0.) CALL QUITER(DELNEW,0,31,INERR)
C
C..STORE ALTERNATE EQUATION DATA
      INTALT(1,IFAC)=IRGALT
      INTALT(2,IFAC)=IMDALT
      INTALT(3,IFAC)=IPLALT
      INTALT(4,IFAC)=MYFRST
      INTALT(5,IFAC)=MYLAST
      R4ALT(1,IFAC)=BASNEW
 1560 R4ALT(2,IFAC)=DELNEW
      CALL EFALTX(INERR)
C
C..READ I/M PARAMS
C
 1565 IF(IMFLG.EQ.0) GOTO 1600
      NLINES=0
      IF(IPROMT.EQ.1) WRITE(IOUASK,1570)
 1570 FORMAT('OENTER YEAR I/M BEGINS, STRINGENCY, M.T. FLAG,'
     *  /' FIRST MODEL YEAR AND LAST MODEL YEAR OF PROG. BENEFITS')
C
      IF(IMFLG.EQ.2) GOTO 1580
C
C..IMFLG=1
      ILDT=0
      IOPTN=50
      NUDATA=0
      IF(INFLAG.EQ.0) READ(IOUGEN,1575,END=1940)
     *    ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2
      IF(INFLAG.EQ.1) READ(IOUGEN,1575,END=1940)
     *    ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2
 1575 FORMAT(I2,1X,I2,1X,I1,1X,I2,1X,I2)
      GOTO 1595
C
C..IMFLG=2
 1580 IF(IPROMT.EQ.1) WRITE(IOUASK,1585)
 1585 FORMAT(' VEH.TYPE,OPTION,AND NEWDATA FLAG')
      IF(INFLAG.EQ.0) READ(IOUGEN,1590,END=1940)
     *    ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2,ILDT,IOPTN,NUDATA
      IF(INFLAG.EQ.1) READ(IOUGEN,1590,END=1940)
     *    ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2,ILDT,IOPTN,NUDATA
 1590 FORMAT(I2,1X,I2,1X,I1,1X,I2,1X,I2,1X,I1,1X,I2,1X,I1)
C
C..CHECK I/M INPUTS
 1595 CALL YRTEST(ICYIM,32,IY1970,IY2020,INERR)
      IF(ISTRIN.LT.10.OR.ISTRIN.GT.50) CALL QUITER(0.,ISTRIN,33,INERR)
      IF(IMTFLG.LT.0.OR.IMTFLG.GT.1) CALL QUITER(0.,IMTFLG,34,INERR)
      CALL YRTEST(MODYR1,35,IY1951,IY2020,INERR)
      CALL YRTEST(MODYR2,36,IY1951,IY2020,INERR)
      IF(MODYR1.GT.MODYR2) CALL QUITER(0.,0,37,INERR)
      IF(ILDT.LT.0.OR.ILDT.GT.3) CALL QUITER(0.,ILDT,72,INERR)
      IF(IOPTN.LT.50.OR.IOPTN.GT.90) CALL QUITER(0.,IOPTN,73,INERR)
      IF(NUDATA.LT.0.OR.NUDATA.GT.3) CALL QUITER(0.,NUDATA,74,INERR)
      IF(NUDATA.GT.0) CALL NEWDAT(IRDFLG)
C
C
 1600 IF(ICEVFG.LT.2) GOTO 9999
C.. READ TRIPS/DAY AND MILES/DAY
      IF(IPROMT.EQ.1) WRITE(IOUASK,1610)
 1610 FORMAT('OENTER AVERAGE TRIPS/DAY')
      READ(IOUGEN,1620,END=1940) USRTPD
 1620 FORMAT(8F5.1)
      DO 1630 IV=1,MAXVEH
      IF(USRTPD(IV).LT.0.) CALL QUITER(USRTPD(IV),0,54,INERR)
 1630 CONTINUE
C
      IF(IPROMT.EQ.1) WRITE(IOUASK,1640)
 1640 FORMAT('OENTER AVERAGE MILES/DAY')
      READ(IOUGEN,1620,END=1940) USRMPD
      DO 1650 IV=1,MAXVEH
      IF(USRMPD(IV).LT.O.) CALL QUITER(USRMPD(IV),0,55,INERR)
 1650 CONTINUE
      CALL CCEVAX
C
      GOTO 9999
C
C
C
C..READ E.F. CALCULATION INPUT PARAMETERS
C
 1660 CONTINUE
C
C
      IF(IPROMT.EQ.1.AND.SPDFLG.EQ.0) WRITE(IOUASK,1670)
 1670 FORMAT('OENTER REGION, CY,SPD(1),TAMB,PCCN,PCHC,PCCC: ')
      IF(IPROMT.EQ.1.AND.SPDFLG.EQ.1) WRITE(IOUASK,1680)
 1680 FORMAT('OENTER REGION, CY,SPD(3),TAMB,PCCN,PCHC,PCCC: ')
      IF(IPROMT.EQ.1.AND.SPDFLG.EQ.2) WRITE(IOUASK,1690)
 1690 FORMAT('OENTER REGION, CY,SPD(8),TAMB,PCCN,PCHC,PCCC: ')
C
      IF(SPDFLG.EQ.0.AND.INFLAG.EQ.0)
     *READ(IOUGEN,1700,END=1940) IREJN,ICY,SPD(1),TAMB,PCCN,PCHC,PCCC
      IF(SPDFLG.EQ.1.AND.INFLAG.EQ.0)
     *READ(IOUGEN,1710,END=1940)
     *   IREJN,ICY,SPD(1),SPD(2),SPD(3),TAMB,PCCN,PCHC,PCCC
      IF(SPDFLG.EQ.2.AND.INFLAG.EQ.0)
     *READ(IOUGEN,1720,END=1940) IREJN,ICY,SPD,TAMB,PCCN,PCHC,PCCC
      IF(SPDFLG.EQ.0.AND.INFLAG.EQ.1)
     *READ(IOUGEN,1700,END=1940) IREJN,ICY,SPD(1),TAMB,PCCN,PCHC,PCCC
      IF(SPDFLG.EQ.1.AND.INFLAG.EQ.1)
     *READ(IOUGEN,1710,END=1940)
     *   IREJN,ICY,SPD(1),SPD(2),SPD(3),TAMB,PCCN,PCHC,PCCC
      IF(SPDFLG.EQ.2.AND.INFLAG.EQ.1)
     *READ(IOUGEN,1720,END=1940) IREJN,ICY,SPD,TAMB,PCCN,PCHC,PCCC
C
 1700 FORMAT(I1,1X,I2,5(1X,F4.1))
 1710 FORMAT(I1,1X,I2,7(1X,F4.1))
 1720 FORMAT(I1,1X,I2,12(1X,F4.1))
C
      IF(IREJN.EQ.5.AND.IPROMT.EQ.1) WRITE(IOUASK,1730)
 1730 FORMAT('OENTER ALTITUDE:')
      IF(IREJN.EQ.5.AND.INFLAG.EQ.0) READ(IOUGEN,1740,END=1940) ALT
      IF(IREJN.EQ.5.AND.INFLAG.EQ.1) READ(IOUGEN,1740,END=1940) ALT
 1740 FORMAT(F6.0)
C
C.. VALIDATE INPUTS
      IF(IREJN.NE.1.AND.IREJN.NE.2.AND.IREJN.NE.3..AND.IREJN.NE.5)
     *   CALL QUITER(0.,IREJN,24,INERR)
      CALL YRTEST(ICY,38,IY1970,IY2020,INERR)
C
C..CHECK INPUT SPEED(S)
      IF(SPDFLG.EQ.2) GOTO 1770
      IF(SPDFLG.EQ.0) GOTO 1750
      SPD(8)=SPD(3)
      SPD(7)=SPD(2)
      SPD(4)=SPD(2)
      SPD(6)=SPD(1)
      SPD(5)=SPD(1)
      SPD(3)=SPD(1)
      SPD(2)=SPD(1)
      GOTO 1770
C
 1750 DO 1760 IV=2,MAXVEH
 1760 SPD(IV)=SPD(1)
C
 1770 DO 1780 IV=1,MAXVEH
      IF(SPD(IV).LE.0.) CALL QUITER(SPD(IV),0,39,INERR)
      IF(SPD(IV).LT.5.) CALL QUITER(SPD(IV),0,52,INERR)
      IF(SPD(IV).GT.0..AND.SPD(IV).LT.5.) SPD(IV)=5.
      IF(SPD(IV).GT.55.) CALL QUITER(SPD(IV),0,16,INERR)
 1780 IF(SPD(IV).GT.55.) SPD(IV)=55.
C
      TAMB=FLOAT(IFIX(TAMB+.5))
      IF(TAMB.LT.0..OR.TAMB.GT.110.) CALL QUITER(TAMB,0,40,INERR)
      IF(PCCN.LT.0..OR.PCCN.GT.100.) CALL QUITER(PCCN,0,41,INERR)
      IF(PCHC.LT.0..OR.PCHC.GT.100.) CALL QUITER(PCHC,0,42,INERR)
      IF(PCCC.LT.0..OR.PCCC.GT.100.) CALL QUITER(PCCC,0,43,INERR)
      X=PCHC+PCCC
      IF(X.LT.0..OR.X.GT.100.) CALL QUITER(X,0,63,INERR)
      X=X-PCCN
      IF(X.LT.0..OR.X.GT.100.) CALL QUITER(X,0,64,INERR)
C
C..SET DEFAULT ALTITUDE (TREAT REG 6 AS REG 5 WHEN DONE)
      IF(IREJN.EQ.1.OR.IREJN.EQ.2) ALT=500.
      IF(IREJN.EQ.3.OR.IREJN.EQ.4) ALT=5500.
      IF(ALT.LT.-200..OR.ALT.GT.10000.) CALL QUITER(ALT,0,58,INERR)
C
C
      IF(VMFLAG.EQ.1.AND.IPROMT.EQ.1) WRITE(IOUASK,1790)
 1790 FORMAT('OENTER VMT SPLIT:')
C
      IF(VMFLAG.EQ.1.AND.INFLAG.EQ.0) READ(IOUGEN,1820,END=1940) VMTMIX
      IF(VMFLAG.EQ.1.AND.INFLAG.EQ.1) READ(IOUGEN,1820,END=1940) VMTMIX
      IF(VMFLAG.NE.1) GOTO 1810
      X=0.
      DO 1800 IV=1,MAXVEH
      X=VMTMIX(IV)+X
      IF(VMTMIX(IV).LT.0..OR.VMTMIX(IV).GT.1.)
     *      CALL QUITER(VMTMIX(IV),0,17,INERR)
 1800 CONTINUE
      IF(X+1.E-6.LT.1..OR.X-1.E-6.GT.1.) CALL QUITER(X,0,18,INERR)
 1810 CONTINUE
C
 1820 FORMAT(8F4.3)
C
C..HERE READ IN ALUH PARAMS
C..ASSIGN DB/WB DEFAULT TEMPS FOR A/C USAGE (90% FOR DEFAULTS)
C
      DB=85.
      WB=75.
      IF(ALHFLG.EQ.0) GOTO 1900
      IF(ALHFLG.EQ.2) GOTO 1860
      IF(IPROMT.EQ.1) WRITE(IOUASK,1830)
 1830 FORMAT('OENTER AC,XLOAD(3),TRAILR(1),ABSHUM')
      IF(INFLAG.EQ.0)
     *   READ(IOUGEN,1840,END=1940)
     *     AC,XLOAD,TRAILR(1),ABSHUM
      IF(INFLAG.EQ.1)
     *   READ(IOUGEN,1840,END=1940)
     *     AC,XLOAD,TRAILR(1),ABSHUM
 1840 FORMAT(8F4.3,2F4.1)
      DO 1850 IVP=2,MAXLTW
 1850 TRAILR(IVP)=TRAILR(1)
      GOTO 1880
C
C
 1860 IF(IPROMT.EQ.1) WRITE(IOUASK,1870)
 1870 FORMAT('OENTER AC,XLOAD(3),TRAILR(3),ABSHUM,DBTEMP,WBTEMP')
      IF(INFLAG.EQ.0)
     *   READ(IOUGEN,1840,END=1940)
     *     AC,XLOAD,TRAILR,ABSHUM,DB,WB
      IF(INFLAG.EQ.1)
     *   READ(IOUGEN,1840,END=1940)
     *     AC,XLOAD,TRAILR,ABSHUM,DB,WB
C
C
C..VALIDATE INPUTS FOR ALUH
C
 1880 IF(AC.LT.0..OR.AC.GT.1.) CALL QUITER(AC,0,44,INERR)
      IF(AC.GT.0.) CALL QUITER(0.,0,56,INERR)
C
      DO 1890 IVP=1,MAXLTW
      IF(XLOAD(IVP).LT.0..OR.XLOAD(IVP).GT.1.)
     *   CALL QUITER(XLOAD(IVP),0,45,INERR)
      IF(TRAILR(IVP).LT.0..OR.TRAILR(IVP).GT.1.)
     *   CALL QUITER(TRAILR(IVP),0,46,INERR)
 1890 CONTINUE
C
      IF(ABSHUM.LT.20..OR.ABSHUM.GT.140.) CALL QUITER(ABSHUM,0,47,INERR)
C
      IF(DB.LT.0..OR.DB.GT.110.) CALL QUITER(DB,0,40,INERR)
      IF(WB.LT.0..OR.WB.GT.110.) CALL QUITER(WB,0,40,INERR)
      IF(WB.GT.DB) CALL QUITER(0.,0,57,INERR)
C
C
C..HERE READ IN TRUCK CHAR. PARAMS
 1900 IF(TRKFLG.EQ.0) GOTO 1920
      IF(IPROMT.EQ.1) WRITE(IOUASK,1910)
 1910 FORMAT('OENTER HGWGT,HDWGT,HGCID,HDCID (VALUES WILL BE IGNORED)')
      IF(INFLAG.EQ.0)
     *READ(IOUGEN,1930,END=1940) IDUM
      IF(INFLAG.EQ.1)
     *READ(IOUGEN,1930,END=1940) IDUM
 1920 CONTINUE
C
 1930 FORMAT(20A4)
C
      GOTO 9999
```

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C
C
C
 1940 CONTINUE
      IRDFLG = 0
C
 9999 RETURN
      END
      SUBROUTINE NEWDAT(IRDFLG)
C
C
C..PURPOSE:
C
C..SPROG READS UNIT IOUIMD DATA ONLY FOR MODE 2 INPUT.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..IRDFLG  I/O     SET TO 0 IF ERROR WHILE READING UNIT IOUIMD
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..INPUT
C
C
      COMMON/IMCOM/ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2
      COMMON/IMCOM/ILDT,IOPTN,NUDATA,NLINES,STRING(18,9)
      COMMON/IMCRED/IRED(19,20,5,2,2),ITECH4(19,20,5)
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
      INTEGER AGE1ST,BY
C
      READ(IOUIMD,100,END=888,ERR=888)NLINES
  100 FORMAT(I1)
C
      IF(NLINES.EQ.0) GOTO 400
C
      DO 200 LINES=1,NLINES
  200 READ(IOUIMD,300,END=888,ERR=888) (STRING(N,LINES),N=1,18)
  300 FORMAT(18A4)
C
  400 IF(NUDATA.EQ.2) GO TO 700
      DO 500 IP=1,2
      DO 500 ITECH=1,2
      DO 500 ISTRN=1,5
      DO 500 AGE1ST=1,20
  500 READ(IOUIMD,600,END=888,ERR=888)
     *    (IRED(BY,AGE1ST,ISTRN,ITECH,IP),BY=1,19)
  600 FORMAT(19(I2,1X))
      IF(NUDATA.EQ.1) GO TO 999
  700 DO 800 ISTRN=1,5
      DO 800 AGE1ST=1,20
  800 READ(IOUIMD,600,END=888,ERR=888)
     *    (ITECH4(BY,AGE1ST,ISTRN),BY=1,19)
      GOTO 999
C
  888 IRDFLG=0
      WRITE(IOUERR,889)
  889 FORMAT(//' ERROR WHILE READING UNIT IOUIMD',
     *       '(NEW I/M CREDITS).  RUN ABORTED.'//)
C
  999 RETURN
      END
      SUBROUTINE QUITER(X,K,NN,INERR)
C
C
C..PURPOSE:
C
C..SPROG PRINTS ERROR AND WARNING MESSAGES ON UNIT IOUERR.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..X       IN      REAL VALUE ENTERED IN ERROR
C..K       IN      INTEGER VALUE ENTERED IN ERROR
C..NN      IN      ERROR NUMBER
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..INPUT
C..YRTEST
C..TFCALX
C..EFALTX
C..HOTSOK
C..TPD
C..DIURNL
C..XMPD
C..CRANKC
C..IGEPTR
C..IGUPTR
C..IGLPTR
C..IGTPTR
C..IGPPTR
C..INDX3R
C..ISPPTR
C..ISPPT8
C..IEXMPT
C..IGSFPT
C
C
      COMMON/YEARS4/IY1951,IY1970,IY2020
      COMMON/ALTEQU/MAXEQU
      COMMON/ALTCOM/INTALT(5,100),R4ALT(2,100),MODFLG(100),NEWFAC
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      DIMENSION NAMFLG(2,15),NAMVEH(2,8),NAMFNC(2,16),IOBMSG(5)
      DATA NAMFLG/
     *   ' UNK','NOWN',
     *   ' IPR','OMT ',
     *   ' INF','LAG ',
     *   ' SPD','FLG ',
     *   ' VMF','LAG ',
     *   ' MYM','RFG ',
     *   ' ALT','FLG ',
     *   ' IMF','LG  ',
     *   ' ALH','FLG ',
     *   ' UNK','NOWN',
     *   ' IFO','RM  ',
     *   ' PRT','FLG ',
     *   ' ICE','VFG ',
     *   ' IDL','FLG ',
     *   ' NHM','FLG '/
C
      DATA NAMVEH/
     *  'LDGV','    ',
     *  'LDGT','1   ',
     *  'LDGT','2   ',
     *  'HDGV','    ',
     *  'LDDV','    ',
     *  'LDDT','    ',
     *  'HDDV','    ',
     *  'MC  ','    '/
C
      DATA NAMFNC/
     *   ' HOT','SOK ',
     *   ' TPD','    ',
     *   ' DIU','RNL ',
     *   ' XMP','D   ',
     *   ' CRA','NKC ',
     *   ' IGE','PTR ',
     *   ' IGU','PTR ',
     *   ' IGL','PTR ',
     *   ' IGT','PTR ',
     *   ' IGP','PTR ',
     *   ' IND','X3R ',
     *   ' ISP','PTR ',
     *   ' ISP','PT8 ',
     *   ' IEX','MPT ',
     *   ' ITS','WPT ',
     *   ' IGS','FPT '/
C
      DATA IOBMSG/
     *   '  OU',
     *  'T OF',
     *   ' BOU',
     *  'NDS ',
     *  'FOR '/
C
      DATA MAXERR/74/
C
C
C
      N=NN
C..TRAP UNKNOWN ERRORS
      IF(N.LT.1.OR.N.GT.MAXERR) N=1
C..TEST FOR WARNINGS
      IF(N.NE.10.AND.N.NE.16.AND.N.NE.21.AND.N.NE.22.AND.N.NE.31.AND.
     *   N.NE.49.AND.N.NE.50.AND.N.NE.52.AND.N.NE.53.AND.N.NE.56.AND.
     *   N.NE.59.AND.N.NE.71)
     *      WRITE(IOUERR,77)
```

```
   77 FORMAT(//' ***ERROR:')
      GOTO(
     *      100, 200, 200, 200, 200, 200, 200, 200, 200,1000,
     *      200, 200, 200, 200, 200,1600,1700,1800,1900,2000,
     *     2100,2200,2300,2400,2500,2600,2700,2700,2900,3000,
     *     3100,3200,3300,3400,3500,3600,3700,3800,3900,4000,
     *     4100,4200,4300,4400,4500,4600,4700,4800,4900,5000,
     *     5100,5200,5300,5400,5500,5600,5700,5800,5900,6000,
     *     6100,6200,6300,6400,6500,6600,6700,6800,6900,7000,
     *     7100,7200,7300,7400
     *         ),N
C
C
  100 WRITE(IOUERR,110) NN,NAMFLG(1,N),NAMFLG(2,N)
  110 FORMAT('+',10X,I4,2A4)
      GOTO 8888
  200 WRITE(IOUERR,210) K,IOBMSG,NAMFLG(1,N),NAMFLG(2,N)
  210 FORMAT('+',10X,I4,5A4,'FLAG',2A4)
      IF(N.EQ.2) WRITE(IOUERR,220)
  220 FORMAT(' PROMPT/MODE TYPE (0 TO 3) MUST BE CORRECTED BEFORE',
     *       ' YOUR NEXT RUN.')
      GOTO 8888
 1000 WRITE(IOUERR,1010)
 1010 FORMAT(' WARNING: FLAG TRKFLG IGNORED.  "TRKOPC" NO LONGER USED.')
      GOTO 9999
 1600 WRITE(IOUERR,1610) X
 1610 FORMAT(' WARNING: ',G10.3,' SPEED REDUCED TO 55 M.P.H. MAXIMUM')
      GOTO 9999
 1700 WRITE(IOUERR,1710) X,IOBMSG
 1710 FORMAT('+',10X,G10.3,5A4,'VMTMIX (0. TO 1.)')
      GOTO 8888
 1800 WRITE(IOUERR,1810) X
 1810 FORMAT('+',10X,G10.3,' SUM OF VMTMIX IS NOT EQUAL TO 1.')
      GOTO 8888
 1900 WRITE(IOUERR,1910) X
 1910 FORMAT('+',10X,G10.3,' NEGATIVE MODEL YEAR MILEAGE')
      GOTO 8888
 2000 WRITE(IOUERR,2010) X
 2010 FORMAT('+',10X,G10.3,' NEGATIVE MODEL YEAR REGISTRATION')
      GOTO 8888
 2100 WRITE(IOUERR,2110) X
 2110 FORMAT(' WARNING: ',G10.3,' REGISTRATION WITH ZERO MILEAGE')
      GOTO 9999
 2200 WRITE(IOUERR,2210) X
 2210 FORMAT(' WARNING: ',G10.3,' MILEAGE WITH ZERO REGISTRATION')
      GOTO 9999
 2300 WRITE(IOUERR,2310) K,IOBMSG
 2310 FORMAT('+',10X,I4,5A4,'(1 TO 100 PAIRS)')
      GOTO 8888
 2400 WRITE(IOUERR,2410) K,IOBMSG
 2410 FORMAT('+',10X,I4,5A4,'REGION (1,2,3,5 ONLY)')
      GOTO 8888
 2500 WRITE(IOUERR,2510) K,IOBMSG
 2510 FORMAT('+',10X,I4,5A4,'VEHICLE TYPE (1 TO 8)')
      GOTO 8888
 2600 WRITE(IOUERR,2610) K,IOBMSG
 2610 FORMAT('+',10X,I4,5A4,'POLLUTANT (1 TO 3)')
      GOTO 8888
 2700 WRITE(IOUERR,2710) K,IOBMSG,IY1951,IY2020
 2710 FORMAT('+',10X,I4,5A4,'YEAR (',I4,' TO ',I4,')')
      GOTO 8888
 2900 WRITE(IOUERR,2910)
 2910 FORMAT('+',10X,' LAST YEAR CANNOT BE LESS THAN FIRST YEAR')
      GOTO 8888
 3000 WRITE(IOUERR,3010) X
 3010 FORMAT('+',10X,G10.3,' INTERCEPT MUST BE POSITIVE')
      GOTO 8888
 3100 WRITE(IOUERR,3110) X
 3110 FORMAT(' WARNING: ',G10.3,' NEGATIVE SLOPE FOR AGEING VEHICLE')
      GOTO 9999
 3200 WRITE(IOUERR,2710) K,IOBMSG,IY1970,IY2020
      GOTO 8888
 3300 WRITE(IOUERR,3310) K,IOBMSG
 3310 FORMAT('+',10X,I4,5A4,'STRINGENCY (10 TO 50)')
      GOTO 8888
 3400 WRITE(IOUERR,3410) K,IOBMSG
 3410 FORMAT('+',10X,I4,5A4,'MECHANICS TRAINING (0 TO 1)')
      GOTO 8888
 3500 WRITE(IOUERR,3510) K,IOBMSG,IY1951,IY2020
 3510 FORMAT('+',10X,I4,5A4,'MODYR1 (',I4,' TO ',I4,')')
      GOTO 8888
 3600 WRITE(IOUERR,3610) K,IOBMSG,IY1951,IY2020
 3610 FORMAT('+',10X,I4,5A4,'MODYR2 (',I4,' TO ',I4,')')
      GOTO 8888
 3700 WRITE(IOUERR,3710)
 3710 FORMAT('+',10X,' MODYR1 CANNOT BE GREATER THAN MODYR2')
      GOTO 8888
 3800 WRITE(IOUERR,2710) K,IOBMSG,IY1970,IY2020
      GOTO 8888
 3900 WRITE(IOUERR,3910) X
 3910 FORMAT('+',10X,G10.3,' SPEED MUST BE POSITIVE')
      GOTO 8888
 4000 WRITE(IOUERR,4010) X
 4010 FORMAT('+',10X,G10.3,' VALID TEMPERATURE IS 0-110 DEG. (F)')
      GOTO 8888
 4100 WRITE(IOUERR,4110) X,IOBMSG
 4110 FORMAT('+',10X,G10.3,5A4,'PCCN (0. TO 100.)')
      GOTO 8888
 4200 WRITE(IOUERR,4210) X,IOBMSG
 4210 FORMAT('+',10X,G10.3,5A4,'PCHC (0. TO 100.)')
      GOTO 8888
 4300 WRITE(IOUERR,4310) X,IOBMSG
 4310 FORMAT('+',10X,G10.3,5A4,'PCCC (0. TO 100.)')
      GOTO 8888
 4400 WRITE(IOUERR,4410) X,IOBMSG
 4410 FORMAT('+',10X,G10.3,5A4,'AC (0. TO 1.)')
      GOTO 8888
 4500 WRITE(IOUERR,4510) X,IOBMSG
 4510 FORMAT('+',10X,G10.3,5A4,'EXTRA LOAD (0. TO 1.)')
      GOTO 8888
 4600 WRITE(IOUERR,4610) X,IOBMSG
 4610 FORMAT('+',10X,G10.3,5A4,'TRAILERS (0. TO 1.)')
      GOTO 8888
 4700 WRITE(IOUERR,4710) X,IOBMSG
 4710 FORMAT('+',10X,G10.3,5A4,'HUMIDITY (20. TO 140.)')
      GOTO 8888
 4800 WRITE(IOUERR,4810) NAMVEH(1,K),NAMVEH(2,K)
 4810 FORMAT('+',10X,' THERE ARE NO SALES FOR VEHICLE ',2A4)
      GOTO 8888
 4900 WRITE(IOUERR,4910) X
 4910 FORMAT(' WARNING: ',G10.3,' MYR SUM NOT = 1. (WILL NORMALIZE)')
      GOTO 9999
 5000 WRITE(IOUERR,5010)
 5010 FORMAT(' WARNING: FLAG UNFFLG IGNORED.  NO FILE WILL BE WRITTEN.')
      GOTO 9999
 5100 WRITE(IOUERR,5110) K,MAXEQU
 5110 FORMAT('+',10X,'EQUATION',I3,' CAUSES MORE THAN',I3,
     *       ' ALLOWED FOR ANY 1 REG/MODE/POL.')
      GOTO 8888
 5200 WRITE(IOUERR,5210) X
 5210 FORMAT(' WARNING: ',G10.3,' SPEED INCREASED TO 5 M.P.H. MINIMUM')
      GOTO 9999
 5300 WRITE(IOUERR,5310)
 5310 FORMAT(/,' YOU MUST CORRECT ALL FLAGS BEFORE YOU RUN AGAIN.')
      GOTO 8888
 5400 WRITE(IOUERR,5410) X
 5410 FORMAT('+',10X,G10.3,' AVERAGE TRIPS/DAY CANNOT BE NEGATIVE')
      GOTO 8888
 5500 WRITE(IOUERR,5510) X
 5510 FORMAT('+',10X,G10.3,' AVERAGE MILES/DAY CANNOT BE NEGATIVE')
      GOTO 8888
 5600 WRITE(IOUERR,5610)
 5610 FORMAT(' COMMENT:  A/C CORRECTION FACTOR WILL BE CALCULATED.'
     *   /11X,'VALUE OF INPUTTED AC USAGE PARAMETER IS IGNORED.')
      GOTO 9999
 5700 WRITE(IOUERR,5710)
 5710 FORMAT('+',10X,'WB TEMP CANNOT BE GREATER THAN DB TEMP')
      GOTO 8888
 5800 WRITE(IOUERR,5810) X,IOBMSG
 5810 FORMAT('+',10X,G10.3,5A4,'ALTITUDE (-200 TO 10,000 FT.)')
      GOTO 8888
 5900 WRITE(IOUERR,5910) K,(INTALT(I,K),I=1,3)
 5910 FORMAT(' WARNING: EQUATION',I3,' ZEROES ALL IDLE COEFFICIENTS',
     *   ' (AND TOTAL) FOR IR=',I1,', IV=',I1,', IP=',I1)
      GOTO 9999
 6000 WRITE(IOUERR,6010) X,INERR,NAMFNC(1,K),NAMFNC(2,K)
 6010 FORMAT('+',10X,G10.3,' DEFAULT USED FOR',I5,' IN FUNCTION',2A4)
      GOTO 8888
 6100 WRITE(IOUERR,6110) INERR,NAMFNC(1,K),NAMFNC(2,K)
 6110 FORMAT('+',10X,' DEFAULT USED FOR',I5,' IN INDEX FUNCTION',2A4)
      GOTO 8888
 6200 WRITE(IOUERR,6210) K,IOBMSG
 6210 FORMAT('+',10X,I4,5A4,'ALTEQU REGION (1,2,3 ONLY)')
      GOTO 8888
 6300 WRITE(IOUERR,6310) X,IOBMSG
 6310 FORMAT('+',10X,G10.3,5A4,'(0. <= PCHC+PCCC <= 100.)')
      GOTO 8888
 6400 WRITE(IOUERR,6410) X,IOBMSG
 6410 FORMAT('+',10X,G10.3,5A4,'(0. <= PCHC+PCCC-PCCN <= 100.)')
      GOTO 8888
 6500 WRITE(IOUERR,6510) K
 6510 FORMAT('+',10X,' MYR OF LDDV NOT EQUAL TO LDGV FOR IDX=',I2)
      GOTO 8888
 6600 WRITE(IOUERR,6610) K
 6610 FORMAT('+',10X,' MYR OF LDDT NOT EQUAL TO LDGT1 FOR IDX=',I2)
      GOTO 8888
 6700 WRITE(IOUERR,6710) NAMVEH(1,K),NAMVEH(2,K)
 6710 FORMAT('+',10X,' EFRETM>0. AND GSF=0. FOR VEHICLE ',2A4)
      GOTO 8888
 6800 WRITE(IOUERR,6810) NAMVEH(1,K),NAMVEH(2,K)
 6810 FORMAT('+',10X,' EFRETM<=0. AND VMTMIX>0. FOR VEHICLE ',2A4)
      GOTO 8888
 6900 WRITE(IOUERR,6910) NAMVEH(1,K),NAMVEH(2,K)
 6910 FORMAT('+',10X,' IDLRTM>0. AND GSF=0. FOR VEHICLE ',2A4)
      GOTO 8888
 7000 WRITE(IOUERR,7010) NAMVEH(1,K),NAMVEH(2,K)
 7010 FORMAT('+',10X,' IDLRTM<=0. AND VMTMIX>0. FOR VEHICLE ',2A4)
      GOTO 8888
 7100 WRITE(IOUERR,7110) IOUUNF,IOUREP,IOUERR,IOUASK
 7110 FORMAT(' COMMENT: CURRENT OUTPUT UNIT NUMBERS ARE',
     *   ' IOUUNF=',I1,' IOUREP=',I1,' IOUERR=',I1,' IOUASK=',I1)
      GOTO 9999
 7200 WRITE(IOUERR,7210) K,IOBMSG
 7210 FORMAT('+',10X,I4,5A4,'VEHICLE TYPE (0 TO 3)')
      GOTO 8888
 7300 WRITE(IOUERR,7310) K,IOBMSG
 7310 FORMAT('+',10X,I4,5A4,'OPTION (50 TO 90)')
      GOTO 8888
 7400 WRITE(IOUERR,7410) K,IOBMSG
 7410 FORMAT('+',10X,I4,5A4,'NEW DATA FLAG (0 TO 3)')
C
C..MESSAGES 60 AND 61 PRODUCE EXCESSIVE OUTPUT IF NOT STOPPED HERE
C
 8888 IF(N.EQ.1.OR.N.EQ.2.OR.N.EQ.53.OR.N.EQ.60.OR.N.EQ.61) STOP
      INERR=INERR+1
C
 9999 RETURN
      END
      SUBROUTINE YRTEST(IY,NERR,IY1,IY2,INERR)
C
C
C..PURPOSE:
C
C..SPROG CONVERTS 2-DIGIT INPUT YEAR TO 4-DIGIT YEAR
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..IY      I/O     YEAR TO TEST AND ADJUST TO 4-DIGIT YEAR
C..NERR    IN      NUMBER OF ERROR IF IY IS OUT OF BOUNDS
C..IY1     IN      LOWER 4-DIGIT BOUND FOR IY
C..IY2     IN      UPPER 4-DIGIT BOUND FOR IY
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..INPUT
C
C
C
      II=IY+1900
      IF(IY.LT.50) II=IY+2000
      IF(IY.LT.0.OR.II.LT.IY1.OR.II.GT.IY2)
     *   CALL QUITER(0.,IY,NERR,INERR)
      IY=II
      RETURN
      END
      SUBROUTINE OUTPUT(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO RESULTS ON UNIT IOUREP.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY      IN      CALENDAR YEAR
C..EFRETM   IN      COMPOSITE EMISSION FACTORS
C..WTEDEF   IN      TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC   IN      HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM   IN      HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD   IN      TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..OUTHD0
C..OUTDT0
C..OUTHD1
C..OUTDT1
C..OUTHD2
C..OUTDT2
C..OUTHD3
C..OUTDT3
C..OUTHD4
C..OUTDT4
C
C
C..USED BY:
C
C..MAIN
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/ALTCOM/INTALT(5,100),R4ALT(2,100),MODFLG(100),NEWFAC
      COMMON/REGCOM/IREJN,ALT
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
C
      REAL EFRETM(3,9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
C
C
C
      IF(ALTFLG.EQ.0) GOTO 200
C
C..ZERO IDLE TOTAL FOR ANY IP WITH ALTERNATE EQUATION FOR CURRENT IREJN.
C
      DO 100 IFAC=1,NEWFAC
      IF(MODFLG(IFAC).EQ.0) GOTO 100
      IR=INTALT(1,IFAC)
      IF(IR.NE.IREJN) GOTO 100
      IP=INTALT(3,IFAC)
      IDLWTD(IP)=0.
  100 CONTINUE
C
C..SELECT REPORT FORMAT
C
  200 IFORMX=IFORM+1
      GOTO(300,400,500,600,700),IFORMX
C..IFORM=0
  300 IF(INITPR.EQ.1) CALL OUTHD0
      CALL OUTDT0(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
      GOTO 999
C..IFORM=1
  400 IF(INITPR.EQ.1) CALL OUTHD1
      CALL OUTDT1(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
      GOTO 999
C..IFORM=2
  500 IF(INITPR.EQ.1) CALL OUTHD2
      CALL OUTDT2(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
      GOTO 999
C..IFORM=3
  600 IF(INITPR.EQ.1) CALL OUTHD3
      CALL OUTDT3(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
      GOTO 999
C..IFORM=4
  700 IF(INITPR.EQ.1) CALL OUTHD4
      CALL OUTDT4(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
  999 RETURN
      END
      SUBROUTINE OUTHDO
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO HEADER ON UNIT IOUREP FOR IFORM=0.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..OUTHDR
C
C
C..USED BY:
C
C..OUTPUT
C
C
C
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      DIMENSION NAMVEH(6)
C
      DATA NAMVEH/
     *   'LDV ',
     *   'LDT1',
     *   'LDT2',
     *   'HDG ',
     *   'HDD ',
     *   'MC '/
C
C
C
      CALL OUTHDR(IOUREP)
C
      WRITE(IOUREP,100) NAMVEH,NAMVEH
  100 FORMAT(
     *'0','R',41X,'P'
     */1X,'E',8X,'SPEEDS',5X,'AMB.',18X,'O',8X,
     *   'COMPOSITE EMISSION FACTORS',18X,'VEHICLE MIX',16X,'C.E.F.'
     */1X,'G CY  LD   HD   MC  TMP   COLD/HOT START  L',
     *   6(3X,A4),
     *   6(2X,A4),'ALL VEH'
     */1X,'- -- ',14('-'),' ---  ',16('-'),
     *   ' - ',41('-'),
     *   1X,35('-'),1X,6('-'))
C
      RETURN
      END
      SUBROUTINE OUTHD1
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO HEADER ON UNIT IOUREP FOR IFORM=1.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..OUTHDR
C..OUTALT
C..OUTMTH
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
C
C
      CALL OUTHDR(IOUREP)
C
      IF(ALTFLG.EQ.1) CALL OUTALT
C
      CALL OUTMTH
C
      WRITE(IOUREP,100)
  100 FORMAT(1X,80('-'))
C
      RETURN
      END
      SUBROUTINE OUTHD2
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO HEADER ON UNIT IOUREP FOR IFORM=2.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..OUTHDR
C
C
C..USED BY:
C
C..OUTPUT
C
C
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      DIMENSION NAMVEH(2,9)
C
      DATA NAMVEH/
     *   'LDGV','    ',
     *   'LDGT','1   ',
     *   'LDGT','2   ',
     *   'LDGT','    ',
     *   'HDGV','    ',
     *   'LDDV','    ',
     *   'LDDT','    ',
     *   'HDDV','    ',
     *   'MC  ','    '/
C
C
C
      CALL OUTHDR(IOUREP)
C
      MAXV=MAXVEH+1
      WRITE(IOUREP,100) NAMVEH,((NAMVEH(I,IV),I=1,2),IV=1,3),
     *   ((NAMVEH(I,IV),I=1,2),IV=5,MAXV)
  100 FORMAT(
     *'0','C R   *CODE A*'
     */1X,'O E',44X,'AMB.'
     */1X,'D G CY',13X,'VEHICLE SPEEDS',14X,'TMP   COLD/HOT START'
     *   ,'    ALT.'
     */1X,'- - -- ',39('-'),' ---  ',16('-'),1X,6('-')
     */
     */1X,'C P   *CODE B*'
     */1X,'O O',18X,'COMPOSITE EMISSION FACTORS'
     */1X,'D L',9(2X,A4,A1)
     */1X,'- -  ',63('-')
     */
     */1X,'C     *CODE C*'
     */1X,'O',19X,'VEHICLE MIX',19X,'C.E.F.'
     */1X,'D',8(1X,A4,A1),'ALL VEH'
     */1X,'- ',47('-'),1X,6('-'))
C
      RETURN
      END
      SUBROUTINE OUTHD3
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO HEADER ON UNIT IOUREP FOR IFORM=3.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..OUTHDR
C..OUTALT
C..OUTMTH
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MOEFLG
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
C
C
      CALL OUTHDR(IOUREP)
C
      IF(ALTFLG.EQ.1) CALL OUTALT
C
      CALL OUTMTH
C
      WRITE(IOUREP,100)
  100 FORMAT(1X,112('-'))
C
      RETURN
      END
      SUBROUTINE OUTHD4
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO HEADER ON UNIT IOUREP FOR IFORM=4.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..OUTHDR
C..OUTALT
C..OUTMTH
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
C
C
      CALL OUTHDR(IOUREP)
C
      IF(ALTFLG.EQ.1) CALL OUTALT
C
      CALL OUTMTH
C
      WRITE(IOUREP,100)
  100 FORMAT(1X,80('-'))
C
      RETURN
      END
      SUBROUTINE OUTDTO(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO DETAILS ON UNIT IOUREP FOR IFORM=0.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY     IN      CALENDAR YEAR
C..EFRETM  IN      COMPOSITE EMISSION FACTORS
C..WTEDEF  IN      TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC  IN      HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM  IN      HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD  IN      TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..OUTPOL
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      REAL EFRETM(3,9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
C
C
C
      CALL OUTPOL(IP1,IP2)
      ITAMB=IFIX(TAMB)
      ICY2=ICY-((ICY/100)*100)
C
      IF((ICEVFG.EQ.1.OR.ICEVFG.EQ.3).AND.IP1.EQ.1) WRITE(IOUREP,100)
     *   IREJN,ICY2,SPD(1),SPD(4),SPD(8),ITAMB,PCCN,PCHC,PCCC,
     *       (COMCCC(IV),IV=1,4),(COMCCC(IV),IV=7,MAXVEH),
     *   (VMTMIX(IV),IV=1,4),(VMTMIX(IV),IV=7,MAXVEH)
  100 FORMAT(
     *1X,I1,1X,I2,1X,2(F4.1,'/'),F4.1,I4,3F6.1,
     *1X,'E',6F7.2,
     *6F6.3)
C
      DO 200 IP=IP1,IP2
      WRITE(IOUREP,300)
     *   IREJN,ICY2,SPD(1),SPD(4),SPD(8),ITAMB,PCCN,PCHC,PCCC,
     *   IP,(EFRETM(IP,IV),IV=1,4),(EFRETM(IP,IV),IV=7,MAXVEH),
     *   (VMTMIX(IV),IV=1,4),(VMTMIX(IV),IV=7,MAXVEH),WTEDEF(IP)
  200 CONTINUE
  300 FORMAT(
     *1X,I1,1X,I2,1X,2(F4.1,'/'),F4.1,I4,3F6.1,
     *1X,I1,6F7.2,
     *6F6.3,F7.2)
C
      RETURN
      END
      SUBROUTINE OUTDT1(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO DETAILS ON UNIT IOUREP FOR IFORM=1.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY      IN     CALENDAR YEAR
C..EFRETM   IN     COMPOSITE EMISSION FACTORS
C..WTEDEF   IN     TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC   IN     HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM   IN     HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD   IN     TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..OUTPOL
C..OUTIMP
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      REAL EFRETM(3,9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
      DIMENSION NAMVEH(6),NAMREG(2,6),NAMPOL(3),NAMNMH(2,2)
C
      DATA NAMVEH/
     *   'LDV ',
     *   'LDT1',
     *   'LDT2',
     *   'HDG ',
     *   'HDD ',
     *   'MC '/
C
      DATA NAMREG/
     *   '49-S','TATE',
     *   '  CA','LIF.',
     *   ' HI-','ALT.',
     *   'CA H','IALT',
     *   ' EVL','ALT.',
     *   'CA E','VALT'/
C
      DATA NAMPOL/
     *   ' HC:',
     *   ' CO:',
     *   'NOX:'/
C
      DATA NAMNMH/
     *   '   T','OTAL',
     *   'NON-','METH'/
C
C
C
      CALL OUTPOL(IP1,IP2)
C
      WRITE(IOUREP,100)
     *   NAMVEH,
     *   ICY,TAMB,(VMTMIX(IV),IV=1,4),(VMTMIX(IV),IV=7,MAXVEH),
     *    (NAMREG(I,IREJN),I=1,2),SPD(1),SPD(4),SPD(8),SPD(4),
     *       PCCN,PCHC,PCCC
  100 FORMAT(
     * 1X,31X,'VEH. TYPE:',6(2X,A4),
     */1X,' CAL. YEAR:',I5,5X,'TEMP:',F5.1,'(F)',8X,5(F5.3,'/'),F5.3,
     */1X,' REGION: ',2A4,4X,2(F4.1,'/'),F4.1,' MPH (',F4.1,')',
     *      2(F5.1,'/'),F5.1)
C
      IF(ALHFLG.GT.0) WRITE(IOUREP,200)
     *   AC,(XLOAD(IVP),IVP=1,3),(TRAILR(IVP),IVP=1,1),
     *      ABSHUM
  200 FORMAT(
     */1X,'  AC:',F6.2,'  XLOAD:',3F7.2,'  TRAILR:',F7.2,
     *      '  ABSHUM:',F7.2)
C
      IF(IMFLG.EQ.1.OR.IMFLG.EQ.2) CALL OUTIMP
C
      WRITE(IOUREP,500) NAMVEH
  500 FORMAT(
     *'0',22X,'COMPOSITE EMISSION FACTORS (GM/MILE)',
     */1X,12X,6(5X,A4),'  ALL MODES')
C
C
      DO 590 IP=IP1,IP2
      IF(IP.NE.1) GOTO 550
C
      WRITE(IOUREP,510)
     *    (NAMNMH(I,NMHFLG+1),I=1,2),NAMPOL(IP),
     *    (EFRETM(IP,IV),IV=1,4),(EFRETM(IP,IV),IV=7,MAXVEH),
     *   WTEDEF(IP)
  510 FORMAT(
     * 1X,2A4,A4,
     *   6F9.2,
     *    F9.2)
      IF(ICEVFG.EQ.1.OR.ICEVFG.EQ.3) WRITE(IOUREP,520)
     *   NAMPOL(IP),
     *    (COMCCC(IV),IV=1,4),(COMCCC(IV),IV=7,MAXVEH)
  520 FORMAT(
     * 1X,'   *EVAP',A4,
     *    6F9.2,5X,'----')
      GOTO 590
C
  550 WRITE(IOUREP,560)
     *   NAMPOL(IP),
     *    (EFRETM(IP,IV),IV=1,4),(EFRETM(IP,IV),IV=7,MAXVEH),
     *   WTEDEF(IP)
  560 FORMAT(
     * 1X,'EXHAUST ',A4,
     *   6F9.2,
     *    F9.2)
  590 CONTINUE
C
C
      IF(IDLFLG.EQ.0) GOTO 800
      WRITE(IOUREP,600)
  600 FORMAT(
     *'0',17X,'HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)')
C
C
      DO 690 IP=IP1,IP2
      IF(IP.NE.1) GOTO 650
C
      IF(NMHFLG.EQ.0) GOTO 650
      WRITE(IOUREP,610)
     *   NAMPOL(IP),
     *    (IDLRTM(IP,IV),IV=1,4),(IDLRTM(IP,IV),IV=7,MAXVEH),
     *   IDLWTD(IP)
  610 FORMAT(
     * 1X,'NM-IDLE ',A4,
     *   6F9.2,
     *    F9.2)
      GOTO690
C
  650 WRITE(IOUREP,660)
     *   NAMPOL(IP),
     *    (IDLRTM(IP,IV),IV=1,4),(IDLRTM(IP,IV),IV=7,MAXVEH),
     *   IDLWTD(IP)
  660 FORMAT(
     * 1X,'   IDLE ',A4,
     *   6F9.2,
     *    F9.2)
  690 CONTINUE
C
C
  800 WRITE(IOUREP,810)
  810 FORMAT(1X,80('-'))
C
      RETURN
      END
      SUBROUTINE OUTDT2(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO DETAILS ON UNIT IOUREP FOR IFORM=2.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY      IN      CALENDAR YEAR
C..EFRETM   IN      COMPOSITE EMISSION FACTORS
C..WTEDEF   IN      TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC   IN      HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM   IN      HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD   IN      TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..OUTPOL
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      REAL EFRETM(3,9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
C
C
C
      CALL OUTPOL(IP1,IP2)
      ITAMB=IFIX(TAMB)
      ICY2=ICY-((ICY/100)*100)
C
      IF((ICEVFG.EQ.1.OR.ICEVFG.EQ.3).AND.IP1.EQ.1) WRITE(IOUREP,100)
     *   IREJN,ICY2,SPD,ITAMB,PCCN,PCHC,PCCC,ALT,
     *   (COMCCC(IV),IV=1,3),COMCCC(9),(COMCCC(IV),IV=4,MAXVEH),
     *   VMTMIX
  100 FORMAT(
     * 1X,'A',1X,I1,1X,I2,1X,7(F4.1,'/'),F4.1,I4,3F6.1,1X,F6.0
     */1X,'B',1X,'E',9F7.2
     */1X,'C',8F6.3)
C
      DO 200 IP=IP1,IP2
      WRITE(IOUREP,300)
     *   IREJN,ICY2,SPD,ITAMB,PCCN,PCHC,PCCC,ALT,
     *   IP,(EFRETM(IP,IV),IV=1,3),EFRETM(IP,9),(EFRETM(IP,IV),IV=4,
     *      MAXVEH),
     *   VMTMIX,WTEDEF(IP)
  200 CONTINUE
C
  300 FORMAT(
     * 1X,'A',1X,I1,1X,I2,1X,7(F4.1,'/'),F4.1,I4,3F6.1,1X,F6.0
     */1X,'B',1X,I1,9F7.2
     */1X,'C',8F6.3,F7.2)
C
      RETURN
      END
      SUBROUTINE OUTDT3(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO DETAILS ON UNIT IOUREP FOR IFORM=3.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY      IN     CALENDAR YEAR
C..EFRETM   IN     COMPOSITE EMISSION FACTORS
C..WTEDEF   IN     TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC   IN     HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM   IN     HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD   IN     TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..OUTPOL
C..OUTIMP
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      REAL EFRETM(3,9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
      DIMENSION NAMVEH(2,10),NAMREG(4,6),NAMPOL(3),NAMNMH(2,2)
C
      DATA NAMVEH/
     *   '    ','LDGV',
     *   '   L','DGT1',
     *   '   L','DGT2',
     *   '    ','LDGT',
     *   '    ','HDGV',
     *   '    ','LDDV',
     *   '    ','LDDT',
     *   '    ','HDDV',
     *   '    ','MC  ',
     *   'ALL ','VEH.'/
C
      DATA NAMREG/
     *   '49-S','TATE',' LOW','ALT.',
     *   'CALI','F. L','OWAL','T.  ',
     *   '49-S','TATE',' HIA','LT. ',
     *   'CALI','F. H','IALT','.   ',
     *   '49-S','TATE',' EVL','ALT.',
     *   'CALI','F. E','VLAL','T.  '/
C
      DATA NAMPOL/
     *   ' HC:',
     *   ' CO:',
     *   'NOX:'/
C
      DATA NAMNMH/
     *   '   T','OTAL',
     *   'NON-','METH'/
C
C
C
      CALL OUTPOL(IP1,IP2)
C
      WRITE(IOUREP,100)
     *   ICY,
     *   (NAMREG(I,IREJN),I=1,4),
     *   ALT,
     *   TAMB,
     *   PCCN,PCHC,PCCC
  100 FORMAT(
     *'0',' CAL. YEAR:',I5,
     * 6X,'REGION: ',4A4,
     * 6X,'ALT:',F6.0,' FT.',
     * 6X,'TAMB:',F5.1,'(F)',
     * 6X,2(F5.1,'/'),F5.1)
C
      IF(ALHFLG.GT.0) WRITE(IOUREP,110)
     *   AC,DB,WB,
     *   ABSHUM
  110 FORMAT(
     * 1X,46X,'AC (DB/WB):',F5.1,' (',F5.1,'/',F5.1,')',
     * 6X,'ABSHUM:',F6.2)
C
      IF(IMFLG.EQ.1.OR.IMFLG.EQ.2) CALL OUTIMP
C
      WRITE(IOUREP,160)
     *   NAMVEH,
     *   SPD,
     *   VMTMIX
  160 FORMAT(
     *'0','  VEH. TYPE:',10(2X,2A4),
     */1X,'VEH. SPEEDS:',F9.1,2F10.1,10X,5F10.1,
     */1X,'    VMT MIX:',F11.3,2F10.3,10X,5F10.3)
C
C
      IF(ALHFLG.GT.0) WRITE(IOUREP,170)
     *   XLOAD,
     *   TRAILR
  170 FORMAT(
     * 1X,' EXTRA LOAD:',F11.3,2F10.3
     */1X,'TRLR IN TOW:',F11.3,2F10.3)
```

```
C
C
      WRITE(IOUREP,200)
  200 FORMAT(
     *'O','COMPOSITE EMISSION FACTORS (GM/MILE)')
C
C
      DO 290 IP=IP1,IP2
      IF(IP.NE.1) GOTO 250
C
      WRITE(IOUREP,210)
     *  (NAMNMH(I,NMHFLG+1),I=1,2),NAMPOL(IP),
     *  (EFRETM(IP,IV),IV=1,3),EFRETM(IP,9),(EFRETM(IP,IV),IV=4,MAXVEH),
     *  WTEDEF(IP)
  210 FORMAT(
     * 1X,2A4,A4,
     *   9F10.2,
     *    F10.2)
      IF(ICEVFG.EQ.1.OR.ICEVFG.EQ.3) WRITE(IOUREP,220)
     *   NAMPOL(IP),
     *    (COMCCC(IV),IV=1,3),COMCCC(9),(COMCCC(IV),IV=4,MAXVEH)
  220 FORMAT(
     * 1X,'   *EVAP',A4,
     *    9F10.2,6X,'----')
      GOTO 290
C
  250 WRITE(IOUREP,260)
     *  NAMPOL(IP),
     *  (EFRETM(IP,IV),IV=1,3),EFRETM(IP,9),(EFRETM(IP,IV),IV=4,MAXVEH),
     *  WTEDEF(IP)
  260 FORMAT(
     * 1X,'EXHAUST ',A4,
     *   9F10.2,
     *    F10.2)
  290 CONTINUE
C
C
      IF(IDLFLG.EQ.0) GOTO 800
      WRITE(IOUREP,300)
  300 FORMAT(
     *'O','HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)')
C
C
      DO 390 IP=IP1,IP2
      IF(IP.NE.1) GOTO 350
C
      IF(NMHFLG.EQ.0) GOTO 350
      WRITE(IOUREP,310)
     *  NAMPOL(IP),
     *  (IDLRTM(IP,IV),IV=1,3),IDLRTM(IP,9),(IDLRTM(IP,IV),IV=4,MAXVEH),
     *  IDLWTD(IP)
  310 FORMAT(
     * 1X,'NM-IDLE ',A4,
     *   9F10.2,
     *    F10.2)
      GOTO390
C
  350 WRITE(IOUREP,360)
```

```
     *  NAMPOL(IP),
     *  (IDLRTM(IP,IV),IV=1,3),IDLRTM(IP,9),(IDLRTM(IP,IV),IV=4,MAXVEH),
     *  IDLWTD(IP)
  360 FORMAT(
     * 1X,'   IDLE ',A4,
     *    9F10.2,
     *     F10.2)
  390 CONTINUE
C
C
  800 WRITE(IOUREP,810)
  810 FORMAT(1X,112('-'))
C
      RETURN
      END
      SUBROUTINE OUTDT4(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO DETAILS ON UNIT IOUREP FOR IFORM=4.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY      IN      CALENDAR YEAR
C..EFRETM   IN      COMPOSITE EMISSION FACTORS
C..WTEDEF   IN      TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC   IN      HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM   IN      HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD   IN      TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..OUTPOL
C..OUTIMP
C
C
C..USED BY:
C
C..OUTPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      REAL EFRETM(3,9),WTEDEF(3),COMCCC(9),IDLRTM(3,9),IDLWTD(3)
      DIMENSION NAMVEH(2,10),NAMREG(4,6),NAMPOL(3),NAMNMH(2,2)
C
      DATA NAMVEH/
     *   '  LD','GV  ',
     *   ' LDG','T1  ',
     *   ' LDG','T2  ',
     *   '  LD','GT  ',
     *   '  HD','GV  ',
     *   '  LD','DV  ',
     *   '  LD','DT  ',
     *   '  HD','DV  ',
     *   '  MC','    ',
     *   'ALL ','VEH '/
C
      DATA NAMREG/
     *   '49-S','TATE',' LOW','ALT.',
     *   'CALI','F. L','OWAL','T.  ',
     *   '49-S','TATE',' HIA','LT. ',
     *   'CALI','F. H','IALT','.   ',
     *   '49-S','TATE',' EVL','ALT.',
     *   'CALI','F. E','VLAL','T.  '/
C
      DATA NAMPOL/
     *   ' HC:',
     *   ' CO:',
     *   'NOX:'/
C
      DATA NAMNMH/
     *   ' TOT','AL  ',
     *   'NO-M','TH  '/
C
C
C
      CALL OUTPOL(IP1,IP2)
C
      WRITE(IOUREP,100)
     *   ICY,
     *   (NAMREG(I,IREJN),I=1,4),
     *   ALT,
     *   TAMB,
     *   PCCN,PCHC,PCCC
  100 FORMAT(
     *'0',' CAL. YEAR:',I5,
     * 6X,'REGION: ',4A4,
     * 9X,'ALT:',F6.0,' FT.'
     */1X,
     * 24X,'TAMB:',F5.1,'(F)',
     * 6X,2(F5.1,'/'),F5.1)
C
      IF(ALHFLG.GT.0) WRITE(IOUREP,110)
     *   AC,DB,WB,
     *   ABSHUM
  110 FORMAT(
     *17X,'AC (DB/WB):',F5.1,' (',F5.1,'/',F5.1,')',
     * 4X,'ABSHUM:',F6.2)
C
      IF(IMFLG.EQ.1.OR.IMFLG.EQ.2) CALL OUTIMP
C
      WRITE(IOUREP,160)
     *   NAMVEH,
     *   SPD,
     *   VMTMIX
  160 FORMAT(
     *'0','VEH. TYPE:',10(A4,A3),
     */1X,'VEH. SPD.:',F5.1,2F7.1,7X,5F7.1,
     */1X,'  VMT MIX:',3F7.3,7X,5F7.3)
C
C
      IF(ALHFLG.GT.0) WRITE(IOUREP,170)
     *   XLOAD,
     *   TRAILR
  170 FORMAT(
     * 1X,'EXT. LOAD:',3F7.3
     */1X,' TRLR TOW:',3F7.3)
C
C
      WRITE(IOUREP,200)
  200 FORMAT(
     *'0','COMPOSITE EMISSION FACTORS (GM/MILE)')
C
C
      DO 290 IP=IP1,IP2
      IF(IP.NE.1) GOTO 250
C
      WRITE(IOUREP,210)
     *   (NAMNMH(I,NMHFLG+1),I=1,2),NAMPOL(IP),
     *   (EFRETM(IP,IV),IV=1,3),EFRETM(IP,9),(EFRETM(IP,IV),IV=4,MAXVEH),
     *  WTEDEF(IP)
  210 FORMAT(
     * 1X,A4,A2,A4,
     *   F6.2,8F7.2,
     *   F7.2)
      IF(ICEVFG.EQ.1.OR.ICEVFG.EQ.3) WRITE(IOUREP,220)
     *   NAMPOL(IP),
     *    (COMCCC(IV),IV=1,3),COMCCC(9),(COMCCC(IV),IV=4,MAXVEH)
  220 FORMAT(
     * 1X,' *EVAP',A4,
     *    F6.2,8F7.2,'    ----')
      GOTO 290
C
  250 WRITE(IOUREP,260)
     *  NAMPOL(IP),
     *  (EFRETM(IP,IV),IV=1,3),EFRETM(IP,9),(EFRETM(IP,IV),IV=4,MAXVEH),
     *  WTEDEF(IP)
  260 FORMAT(
     * 1X,'EXHST ',A4,
     *   F6.2,8F7.2,
     *    F7.2)
  290 CONTINUE
C
C
      IF(IDLFLG.EQ.0) GOTO 800
      WRITE(IOUREP,300)
  300 FORMAT(
     *'0','HOT STABILIZED IDLE EMISSION FACTORS (GM/MIN)')
C
C
      DO 390 IP=IP1,IP2
      IF(IP.NE.1) GOTO 350
C
      IF(NMHFLG.EQ.0) GOTO 350
      WRITE(IOUREP,310)
     *  NAMPOL(IP),
     *  (IDLRTM(IP,IV),IV=1,3),IDLRTM(IP,9),(IDLRTM(IP,IV),IV=4,MAXVEH),
     *  IDLWTD(IP)
  310 FORMAT(
     * 1X,'NM-ID ',A4,
     *   F6.2,8F7.2,
     *    F7.2)
      GOTO390
C
```

```
  350 WRITE(IOUREP,360)
     *  NAMPOL(IP),
     *  (IDLRTM(IP,IV),IV=1,3),IDLRTM(IP,9),(IDLRTM(IP,IV),IV=4,MAXVEH),
     *  IDLWTD(IP)
  360 FORMAT(
     * 1X,' IDLE ',A4,
     *    F6.2,8F7.2,
     *     F7.2)
  390 CONTINUE
C
C
  800 WRITE(IOUREP,810)
  810 FORMAT(1X,80('-'))
C
      RETURN
      END
      SUBROUTINE OUTHDR(IOUOUT)
C
C
C..PURPOSE:
C
C..SPROG TO WRITE SCENARIO TITLE ON UNIT IOUOUT.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..IOUOUT  INPUT   UNIT NUMBER ON WHICH TITLE IS PRINTED
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..OUTHDO
C..OUTHD1
C..OUTHD2
C..OUTHD3
C..INPUT
C
C
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/PROJCM/PROJID(20)
C
C
C
      INITPR=0
C
      WRITE(IOUOUT,100) PROJID
  100 FORMAT('1',20A4)
C
      RETURN
      END
      SUBROUTINE OUTALT
C
C
C..PURPOSE:
C
C..SPROG TO WRITE ALTERNATE EQUATIONS ON UNIT IOUREP.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..OUTHD1
C..OUTHD3
C..OUTHD4
C
C
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/ALTCOM/INTALT(5,100),R4ALT(2,100),MODFLG(100),NEWFAC
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      DIMENSION NOYES(2)
C
      DATA NOYES/
     *   'NO  ',
     *   'YES '/
C
C
C
      WRITE(IOUREP,100)
  100 FORMAT(
     *'0','   EMISSION FACTOR MODIFICATION PROFILE:',
     */' REGION  VEH.  POLLUTANT  FIRST MY  LAST MY    BASE     ',
     *  'DR   ALTERED',
     *     /,' ------  ----  ---------  --------  -------    ----     ',
     *  '---  -------')
C
      DO 200 IFAC=1,NEWFAC
      INO=1
      IF(MODFLG(IFAC).EQ.1) INO=2
  200 WRITE(IOUREP,300)
     *    (INTALT(I,IFAC),I=1,5),(R4ALT(I,IFAC),I=1,2),NOYES(INO)
  300 FORMAT(1X,2X,I1,7X,I1,8X,I1,2X,2(5X,I4),2X,2(2X,F6.2),4X,A4)
C
      RETURN
      END
      SUBROUTINE OUTMTH
C
C
C..PURPOSE:
C
C..SPROG TO WRITE HC MESSAGE ON UNIT IOUREP.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C
C..NONE
C
C
C..USED BY:
C
C..OUTHD1
C..OUTHD3
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
      DIMENSION NAMOUT(2),NAMTOT(2),NAMNON(2)
C
      DATA NAMTOT/'   T','OTAL'/
C
      DATA NAMNON/'NON-','METH'/
C
C
C
      NAMOUT(1)=NAMTOT(1)
      NAMOUT(2)=NAMTOT(2)
      IF(NMHFLG.EQ.0) GOTO 100
      NAMOUT(1)=NAMNON(1)
      NAMOUT(2)=NAMNON(2)
C
  100 WRITE(IOUREP,200) NAMOUT
  200 FORMAT(
     *'0','  *',2A4,
     *' HC EMISSION FACTORS INCLUDE EVAP. HC EMISSION FACTORS')
C
      RETURN
      END
  340 FORMAT(4X,'I/M IDENTIFICATION RATE HAS BEEN CHANGED TO',I3,'%')
C
      IF(NLINES.EQ.0) GOTO 999
      DO 400 LINES=1,NLINES
  400 WRITE(IOUREP,420) (STRING(N,LINES),N=1,18)
  420 FORMAT(2X,18A4)
C
  999 RETURN
      END
      SUBROUTINE EFCALX(ICY,EFRETM,WTEDEF,COMCCC,IDLRTM,IDLWTD,INERR)
C
C
C..PURPOSE:
C
C..SPROG COMPUTES COMPOSITE EMISSION FACTORS.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY     IN      CALENDAR YEAR
C..EFRETM  OUT     COMPOSITE EMISSION FACTORS
C..WTEDEF  OUT     TOTAL COMPOSITE EMISSION FACTORS
C..COMCCC  OUT     HC EVAPORATIVE EMISSION FACTORS
C..IDLRTM  OUT     HOT STABILIZED IDLE EMISSION FACTORS
C..IDLWTD  OUT     TOTAL HOT STABILIZED IDLE EMISSION FACTORS
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..GETCUM
C..BIGCFX
C..QUITER
C..IGSFPT
C..IEXMPT
C..INDX3R
C..BEF
C..BEFIDL
C
C
C..USED BY:
C
C..MAIN
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/REGCOM/IREJN,ALT
      COMMON/MYMCOM/XMYM(20,8),XMYR(20,8),TF(20,8),TFMYM(20,8)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/GSFCOM/MAXGSF,GSF(18,8,3),IGSFYR(18,8,3)
      COMMON/CUMCOM/CUMMIL(20,8)
      COMMON/BEFGCM/EXMETH(3,8,3),IEXMYR(3,8,3)
C
      REAL IDLFAC,IDLWTD(3),IDLRTM(3,9),IDLFC1,IDLFC2
      DIMENSION COMCCC(9),CFRET(20,3,8,2),EFRETM(3,9),WTEDEF(3)
C
      DATA INITFL/1/
C
C
C
      IF(INITFL.NE.0) CALL GETCUM
      INITFL=0
C
C..SETUP FOR COMPOSITE LGT DUTY GAS TRK
C
      X23=VMTMIX(2)+VMTMIX(3)
      IF(X23.EQ.0.) X23=1.
C
      IR=IREJN
      IF(IR.NE.5) GOTO 100
      IR=1
      IF(ALT.GE.4000.) IR=3
C
C
C  DETERMINE WHETHER THE REGION NEEDS SPEED, TEMPERATURE, ALTITUDE, ETC.
C  CORRECTION FACTORS FOR ONE OR TWO REGIONS.  TWO REGIONS ARE NEEDED
C  WHENEVER THE PROGRAM PERFORMS AN INTERPOLATION BETWEEN TWO REGIONS.
  100 IF(IREJN.EQ.5.AND.ALT.GE.1500.) GOTO 200
      JREJN=IREJN
      IF(IREJN.EQ.5.AND.ALT.LT.1500.) JREJN=1
      CALL BIGCFX(ICY,JREJN,CFRET(1,1,1,1))
      GOTO 300
C
C  REGION IS 5 (INTERPOLATION BETWEEN HIGH AND LOW ALTITUDE)
200   CALL BIGCFX(ICY,1,CFRET(1,1,1,1))
      CALL BIGCFX(ICY,3,CFRET(1,1,1,2))
C
300   DO 390 IP=1,MAXPOL
      WTEDEF(IP)=0.
      IDLWTD(IP)=0.
      EFRETM(IP,9)=0.
      IDLRTM(IP,9)=0.
      IF(IP.EQ.1) COMCCC(9)=0.
C
      DO 380 IV=1,MAXVEH
      EFRETM(IP,IV)=0.
      IDLRTM(IP,IV)=0.
      IF(IP.EQ.1) COMCCC(IV)=0.
      IF(VMTMIX(IV).EQ.0.) GOTO 380
C
      DO 370 IDX=1,20
C
      IF(TF(IDX,IV).LE.0.) GOTO 370
C..INIT EMISSIONS TO ZERO
      COMPCC=0.
      COMPEF=0.
      IDLFAC=0.
C
      JDX=21-IDX
      VMTAGE=CUMMIL(JDX,IV)/10000.
      MY=ICY+IDX-20
      IGS=IGSFPT(MY,IV,IR)
C..GET APPLICABLE NON-METHANE FRACTION
      EXMVAL=1.
      IF(IP.NE.1.OR.NMHFLG.EQ.0) GOTO 305
      IEX=IEXMPT(MY,IV,IR)
      EXMVAL=EXMETH(IEX,IV,IR)
C
C  DETERMINE WHETHER THE COMPOSITE EMISSION REQUIRES AN INTERPOLATION
```

```
C  BETWEEN TWO REGIONS.
  305 IF(IREJN.EQ.5.AND.ALT.GE.1500.) GOTO 330
C
C  THE COMPOSITE EMISSION CALCULATION DOES NOT REQUIRE AN
C  INTERPOLATION BETWEEN TWO REGIONS.
C
        IF(IP.EQ.1) COMPCC=CCEVRT(MY,IV,JREJN)*TF(IDX,IV)
        INDX1=INDX3R(MY,IP,IV,JREJN)
        COMPEF=
       *  (BEF(MY,ICY,INDX1,IP,IV,JREJN,VMTAGE,EXMVAL)*CFRET(IDX,IP,IV,1))
       *  *TF(IDX,IV)+COMPCC
C
C  IDLE EMISSIONS
        IDLFAC=BEFIDL(INDX1,IP,IV,JREJN,VMTAGE,EXMVAL)*TF(IDX,IV)
C
        GOTO 360
C
  330 CONTINUE
C
C.. ONCE THE EVALUATED ALTITUDE METHODOLOGY IS FINALIZED, THE PROCEDURE
C.. WILL BE PUT HERE.
C
360     EFRETM(IP,IV)=EFRETM(IP,IV)+COMPEF
        IDLRTM(IP,IV)=IDLRTM(IP,IV)+IDLFAC
        IF(IP.EQ.1) COMCCC(IV)=COMCCC(IV)+COMPCC
C
  370 CONTINUE
C
        IF(EFRETM(IP,IV).GT.0..AND.GSF(IGS,IV,IR).EQ.0.)
      *    CALL QUITER(0.,IV,67,INERR)
        IF(EFRETM(IP,IV).LE.0.) CALL QUITER(0.,IV,68,INERR)
C
C..ALTFLG TEST ADDED BUT COULD BE BETTER
C..E.G., CHECK 20 YR SPAN FOR USE/NON-USE OF ALTFLG
C..AND ERR-OUT ONLY ON NON-USE OF ALT EQU, ETC. (G.J.H. 7/18/80)
C
        IF(ALTFLG.EQ.0.AND.IDLRTM(IP,IV).GT.0.
      *    .AND.GSF(IGS,IV,IR).EQ.0.)
      *       CALL QUITER(0.,IV,69,INERR)
        IF(ALTFLG.EQ.0.AND.IDLRTM(IP,IV).LE.0.)
      *    CALL QUITER(0.,IV,70,INERR)
        WTEDEF(IP)=WTEDEF(IP)+(EFRETM(IP,IV)*VMTMIX(IV))
        IDLWTD(IP)=IDLWTD(IP)+(IDLRTM(IP,IV)*VMTMIX(IV))
C
380     CONTINUE
C
C..ASSIGN COMPOSITE LGT DUTY GAS TRK
C
        IF(EFRETM(IP,2).GT.0..AND.EFRETM(IP,3).GT.0.) EFRETM(IP,9)=
      *    (EFRETM(IP,2)*VMTMIX(2)+EFRETM(IP,3)*VMTMIX(3))/X23
        IF(IDLRTM(IP,2).GT.0..AND.IDLRTM(IP,3).GT.0.) IDLRTM(IP,9)=
      *    (IDLRTM(IP,2)*VMTMIX(2)+IDLRTM(IP,3)*VMTMIX(3))/X23
        IF(IP.EQ.1.AND.COMCCC(2).GT.0..AND.COMCCC(3).GT.0.) COMCCC(9)=
      *    (COMCCC(2)*VMTMIX(2)+COMCCC(3)*VMTMIX(3))/X23
C
390     CONTINUE
        RETURN
        END
      FUNCTION CCEVRT(MY,IV,IR)
C
C  CCEVRT
C
C  REAL FUNCTION TO DETERMINE A HYDROCARBON CRANKCASE AND EVAPORATIVE
C  EMISSION FACTOR.  THIS FUNCTION PERFORMS THE CALCULATION PREVIOUSLY
C  PERFORMED BY SPROG CCEVAX.
C
C
C
C  ARGUMENTS:
C
C  NAME    TYPE    DIR   DESCRIPTION
C
C  CCEVRT   R      OUT   A REAL FUNCTION NAME THAT RETURNS A HYDRO-
C                        CARBON CRANKCASE AND EVAPORATIVE EMISSION
C                        FACTOR.
C
C  MY       I       IN   MODEL YEAR.
C
C  IV       I       IN   AN INTEGER VARIABLE THAT CONTAINS A VEHICLE
C                        TYPE CODE.  IV IS CURRENTLY EXPECTED TO
C                        CONTAIN VALUES IN THE RANGE 1...8.  THIS
C                        VARIABLE WAS OFTEN CALLED IMODE IN THE
C                        MOBILE1 PROGRAM.
C
C  IR       I       IN   AN INTEGER VARIABLE THAT CONTAINS A REGION
C                        CODE.  CURRENT CODES ARE:
C
C                          1  LOW ALTITUDE
C                          2  CALIFORNIA LOW ALTITUDE
C                          3  HIGH ALTITUDE
C                          4  RESERVED FOR CALIFORNIA HIGH ALTITUDE,
C                               BUT ILLEGAL NOW
C                          5  ILLEGAL CODE FOR THIS SUBPROGRAM.
C                          6  ILLEGAL CODE FOR THIS SUBPROGRAM.
C
C  CALLS:
C
C..HOTSOK
C..TPD
C..DIURNL
C..XMPD
C..CRANKC
C
C  CALLED BY:
C
C       SPROG EFCALX
C
C
C
      X=XMPD(MY,IV,IR)
      IF(X.NE.0.)
     * X=(((HOTSOK(MY,IV,IR)*TPD(MY,IV,IR))
     *   +DIURNL(MY,IV,IR))/X)
     *   +CRANKC(MY,IV,IR)
C
      CCEVRT=X
```

```
25058         C
25059                RETURN
25060                END
```

```
      FUNCTION HOTSOK(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT YEARLY VALUE FOR HOT SOAK
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..CCEVRT
C
C
      COMMON/HOTCOM/MAXHOT,HOTVAL(6,8,3),IHOTYS(6,8,3)
C
C
C
      DO 100 IG=1,MAXHOT
      IF(MY.LE.IHOTYS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(HOTVAL(IG,IV,IR),1,60,MY)
  200 HOTSOK=HOTVAL(IG,IV,IR)
C
      RETURN
      END
      FUNCTION TPD(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT YEARLY VALUE FOR TRIPS/DAY
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY       IN      MODEL YEAR
C..IV       IN      VEHICLE TYPE
C..IR       IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..CCEVRT
C
C
      COMMON/TPDCOM/MAXTPD,TPDVAL(2,8,3),ITPDYS(2,8,3)
C
C
C
      DO 100 IG=1,MAXTPD
      IF(MY.LE.ITPDYS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(TPDVAL(IG,IV,IR),2,60,MY)
  200 TPD=TPDVAL(IG,IV,IR)
C
      RETURN
      END
      FUNCTION DIURNL(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT YEARLY VALUE FOR DIURNAL
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..CCEVRT
C
C
      COMMON/DIUCOM/MAXDIU,DIUVAL(6,8,3),IDIUYS(6,8,3)
C
C
C
      DO 100 IG=1,MAXDIU
      IF(MY.LE.IDIUYS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(DIUVAL(IG,IV,IR),3,60,MY)
  200 DIURNL=DIUVAL(IG,IV,IR)
C
      RETURN
      END
      FUNCTION XMPD(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT YEARLY VALUE FOR MILES/DAY
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..CCEVRT
C
C
      COMMON/XMPCOM/NXXXMP,XMPVAL(2,8,3),IXMPYS(2,8,3)
C
C
C
      DO 100 IG=1,NXXXMP
      IF(MY.LE.IXMPYS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(XMPVAL(IG,IV,IR),4,60,MY)
  200 XMPD=XMPVAL(IG,IV,IR)
C
      RETURN
      END
      FUNCTION CRANKC(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT YEARLY VALUE FOR CRANKCASE
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..CCEVRT
C
C
      COMMON/CRACOM/MAXCRA,CRAVAL(3,8,3),ICRAYS(3,8,3)
C
C
C
      DO 100 IG=1,MAXCRA
      IF(MY.LE.ICRAYS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(CRAVAL(IG,IV,IR),5,60,MY)
  200 CRANKC=CRAVAL(IG,IV,IR)
C
      RETURN
      END
      SUBROUTINE BIGCFX(ICY,IR,CFRET)
C
C
C..PURPOSE:
C
C..SPROG COMPUTES CORRECTION FACTORS APPLIED TO COMPOSITE EMISSION
C..FACTORS, E.G., SPEED, TEMPERATURE, HUMIDITY, ETC.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY     IN      CALENDAR YEAR
C..IR      IN      REGION OF INTEREST
C..CFRET   OUT     CORRECTION FACTORS TO APPLY TO BASIC EMISSION FACTORS
C
C
C..USES SPROGS:
C
C..SPFCLX
C..ALUH
C..IGPPTR
C..ISPPTR
C..ISPPT8
C
C
C..USED BY:
C
C..EFCALX
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/ACOM/AIN(6,18,3)
      COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
      COMMON/RET1/ALHRET(20,4,3)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IVPCOM/IVPTRG(8),IVPTRT(8),IVPTRA(8),IVPTRB(8)
      COMMON/TCFCOM/TTACOF(2,3,9,3,6),TT4COF(2,9,3),TT7COF(2,3)
      COMMON/GPCCOM/GPACOF(8,9,3,6),GPBCOF(3,3,3,4)
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/CUMCOM/CUMMIL(20,8)
C
      DIMENSION SPBACK(18,3,8),CFRET(20,3,8),TCF(3),CHFRAC(3),NCATYR(8)
      DIMENSION FTPSPD(3)
      DATA FTPSPD/26.0,16.0,26.0/
      DIMENSION SCFADJ(3,4)
      DIMENSION ISPGRP(3,4)
C
      DATA NCATYR/
     *   1974,
     *   1974,
     *   1978,
     *   1983,
     *   2020,
     *   2020,
     *   2020,
     *   2020/
C
C
C
C..CALCULATE AVERAGE SPEED FOR THE OPERATING MODE FRACTIONS
C
      SADJ=PCCC/FTPSPD(1)
     -    +(100.-PCCC-PCHC)/FTPSPD(2)
     -    +PCHC/FTPSPD(3)
      SADJ=100./SADJ
      I=SADJ*10.+0.5
      SADJ=I/10.
C
      CALL SPFCLX(SPD,SPBACK)
      IF(ALHFLG.GT.0) CALL ALUH(ICY,IR)
C
C..FRACTION COLD OP(NON-CAT): FCN
C..FRACTION HOT START(CAT):  FHC
C..FRACTION COLD OP(CAT)   :   FCC
C..FRACTION HOT START(NON-CAT): FHN
C
      FCN=PCCN*.01
      FHC=PCHC*.01
      FCC=PCCC*.01
      FHN=(FCC-FCN)+FHC
C
C..TEMP CORRECTION INITIALIZATION (MID,LOW,HIGH=0,1,2 PATH AND SUB)
C
      IF(TAMB.LT.68.) GOTO 200
      IF(TAMB.GT.86.) GOTO 300
C
      MDLOHI=0
      DO 100 IB=1,3
  100 TCF(IB)=1.
      GOTO 400
C
  200 MDLOHI=1
      TT=TAMB-67.5
      GOTO 400
C
  300 MDLOHI=2
      TT=TAMB-86.5
C
C..SPEED AND TEMP CORRECTION FACTORS INTO "CFRET"
C
  400 DO 900 IDX=1,20
      JDX=21-IDX
      MY=ICY-(20-IDX)
C
C
      DO 900 IV=1,MAXVEH
      IVG=IVPTRG(IV)
      IVT=IVPTRT(IV)
      IVA=IVPTRA(IV)
      IVB=IVPTRB(IV)
      GOTO(420,420,420,440,430,430,440,430),IV
  420 IS=ISPPTR(MY,IR,IVG)
  430 XMILES=CUMMIL(JDX,IV)*.0001
C
C
  440 DO 900 IP=1,MAXPOL
      IF(IV.EQ.8) IS=ISPPT8(MY,IR,IP)
      IG=IGPPTR(MY,IP,IR,IV)
      GOTO(450,450,450,550,450,450,550,450),IV
C
C..ASSIGN COLD/HOT FRACTIONS BY MOD YR GRP
C
  450 CHFRAC(1)=FCN
      CHFRAC(3)=FHN
      IF(MY.LE.NCATYR(IV)) GOTO 500
      CHFRAC(1)=FCC
      CHFRAC(3)=FHC
  500 CHFRAC(2)=1.-CHFRAC(1)-CHFRAC(3)
C
  550 IF(MDLOHI.EQ.0) GOTO 700
      GOTO(577,577,577,633,577,577,666,577),IV
C
C..LO/HI TEMP CORRECTION FACTOR FOR VEH TYPES 1,2,3,5,6,8
C
  577 DO 600 IB=1,3
  600 TCF(IB)=EXP(TTACOF(MDLOHI,IB,IG,IP,IVT)*TT)
      GOTO 700
C
C..LO/HI TEMP CORRECTION FACTOR FOR VEH TYPE 4
C
  633 TCF(1)=EXP(TT4COF(MDLOHI,IG,IP)*TT)
      GOTO 700
C
C..LO/HI TEMP CORRECTION FACTOR FOR VEH TYPE 7
C
  666 TCF(1)=EXP(TT7COF(MDLOHI,IP)*TT)
C
  700 GOTO(725,725,725,710,715,715,715,725),IV
C
C..GPBCOF FOR VEH=4,5,6,7
C
  710 IF(IG.EQ.3) IG=2
  715 ISAVE=IG
      IF(IG.GT.3) IG=3
      S=SPD(IV)
      IF(IV.EQ.4 .OR. IV.EQ.7)
     *    SPDGPB=GPBCOF(3,IP,IG,IVB)*S*S
     *          +GPBCOF(2,IP,IG,IVB)*S
     *          +GPBCOF(1,IP,IG,IVB)
      IF(IV.EQ.5 .OR. IV.EQ.6)
     *    SPDGPB=GPBCOF(3,IP,IG,IVB)*(S*S-SADJ*SADJ)
     *          +GPBCOF(2,IP,IG,IVB)*(S-SADJ)
      IG=ISAVE
      IF(IV.NE.4.OR.IP.NE.3) SPDGPB=EXP(SPDGPB)
      IF(IV.EQ.4.OR.IV.EQ.7) GOTO 750
C
C..SPEED CORRECTIONS FOR VEH TYPES 1,2,3,5,6,8
C
  725 BAGSUM=0.
```

```
      DO 738 IB=1,3
  738 BAGSUM=(GPACOF(2*IB,IG,IP,IVG)*XMILES+GPACOF(2*IB-1,IG,IP,IVG))
     *       *TCF(IB)*CHFRAC(IB)+BAGSUM
C
      BAGSUM=BAGSUM/(GPACOF(8,IG,IP,IVG)*XMILES+GPACOF(7,IG,IP,IVG))
      IF(IV.EQ.5.OR.IV.EQ.6) GOTO 745
      IF(IDX.GT.1 .AND. ISPGRP(IP,IVA).EQ.IS) GO TO 744
      SCF=AIN(6,IS,IP)
      DO 742 ICOEFF=1,5
      SCF=SCF*SADJ+AIN(6-ICOEFF,IS,IP)
 742  CONTINUE
      IF(IP.NE.3) SCF=EXP(SCF)
      SCFADJ(IP,IVA)=SCF
      ISPGRP(IP,IVA)=IS
 744  BAGSUM=(SPBACK(IS,IP,IV)/SCFADJ(IP,IVA))*BAGSUM
      GOTO 800
C
C..ADDITIONAL SPEED CORRECTION FOR VEH 5,6 ONLY
C
  745 BAGSUM=SPDGPB*BAGSUM
      GOTO 800
C
C..SPEED CORRECTIONS FOR VEH TYPES 4,7
C
  750 BAGSUM=TCF(1)*SPDGPB
C
C..OTHER CORRECTIONS FOR A.C., TOWING, ETC. FOR VEH TYPES 1,2,3,8
C
  800 IF(ALHFLG.GT.0.AND.IVA.GT.0) BAGSUM=ALHRET(IDX,IVA,IP)*BAGSUM
  900 CFRET(IDX,IP,IV)=BAGSUM
C
      RETURN
      END
      SUBROUTINE REGMOD(ICY,INERR)
C
C
C..PURPOSE:
C
C..SPROG ADJUSTS MODEL YEAR MILEAGE/REGISTRATION ARRAYS.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY     IN      CALENDAR YEAR
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..TFCALX
C..IGSFPT
C
C
C..USED BY:
C
C..MAIN
C
C
      COMMON/MYMCOM/XMYM(20,8),XMYR(20,8),TF(20,8),TFMYM(20,8)
      COMMON/MYMSAV/SAVMYM(20,8),SAVMYR(20,8)
      COMMON/GSFCOM/MAXGSF,GSF(18,8,3),IGSFYR(18,8,3)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/REGSUM/SUM1(8)
      COMMON/REGCOM/IREJN,ALT
C
      DIMENSION X(20)
C
C
C
      IR=IREJN
      IF(IR.NE.5) GOTO 100
      IR=1
      IF(ALT.GE.4000.) IR=3
C
  100 DO 500 IV=1,MAXVEH
      X(1)=SAVMYR(1,IV)/3.
      IF(IV.EQ.4.OR.IV.EQ.7.OR.IV.EQ.8) X(1)=0.
C
      DO 150 IDX=2,20
  150 X(IDX)=SAVMYR(IDX,IV)
C
      DO 500 IDX=1,20
      MY=ICY-IDX+1
      IGS=IGSFPT(MY,IV,IR)
  500 XMYR(IDX,IV)=GSF(IGS,IV,IR)*X(IDX)
C
C
      DO 700 IV=1,MAXVEH
      Z=.25
      IF(IV.EQ.4.OR.IV.EQ.7.OR.IV.EQ.8) Z=0.
      S=SAVMYM(1,IV)
      SS=SAVMYM(2,IV)
      X(1)=.5*Z*S
      X(2)=Z*(.5*Z*SS+S)+(1.-Z)*((1.+Z)*.5*S)
      SS=SS+S
C
      DO 600 IDX=3,20
      X(IDX)=Z*(.5*Z*SAVMYM(IDX,IV)+SS)+(1.-Z)*(.5*(1.+Z)
     *  *SAVMYM(IDX-1,IV)+S)
      S=SS
  600 SS=SS+SAVMYM(IDX,IV)
C
      XMYM(1,IV)=X(1)
      DO 700 IDX=2,20
  700 XMYM(IDX,IV)=X(IDX)-X(IDX-1)
C
C
      DO 775 IV=1,MAXVEH
      Z=.25
      TFMYM(1,IV)=SAVMYM(1,IV)
      IF(IV.NE.4.AND.IV.NE.7.AND.IV.NE.8) GOTO 750
      Z=0.
      TFMYM(1,IV)=0.
  750 ZZ=1.-Z
C
      DO 775 IDX=2,20
  775 TFMYM(IDX,IV)=SAVMYM(IDX-1,IV)*ZZ+SAVMYM(IDX,IV)*Z
C
C  NORMALIZE MYR
      DO 900 IV=1,MAXVEH
      S=0.
      DO 800 IDX=1,20
  800 S=XMYR(IDX,IV)+S
      SUM1(IV)=S
      IF(S.LE.0.) S=1.
      DO 900 IDX=1,20
  900 XMYR(IDX,IV)=XMYR(IDX,IV)/S
      SUM1(7)=SUM1(1)+SUM1(5)
      SUM1(8)=SUM1(2)+SUM1(6)
      SUM1(1)=SUM1(1)/SUM1(7)
      SUM1(2)=SUM1(2)/SUM1(8)
      SUM1(3)=1.
      SUM1(4)=1.
      SUM1(5)=SUM1(5)/SUM1(7)
      SUM1(6)=SUM1(6)/SUM1(8)
      SUM1(7)=1.
      SUM1(8)=1.
      CALL TFCALX(INERR)
C
      RETURN
      END
      SUBROUTINE TFCALX(INERR)
C
C
C..PURPOSE:
C
C..SPROG COMPUTES THE TRAVEL FACTOR.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..REGMOD
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/MYMCOM/XMYM(20,8),XMYR(20,8),TF(20,8),TFMYM(20,8)
      COMMON/REGSUM/SUM1(8)
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/VMXCOM/VMTMIX(8)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
C
      DIMENSION TFNORM(8),VCOUNT(8)
C
      DATA VCOUNT/102.9,12.9,5.7,4.7,102.9,12.9,1.0,7.3/
C
C
C
      DO 820 IV=1,MAXVEH
      TFNORM(IV)=0.
C
      DO 810 IDX=1,20
  810 TFNORM(IV)=TFNORM(IV)+TFMYM(IDX,IV)*XMYR(IDX,IV)
  820 CONTINUE
      IF(VMFLAG.NE.0) GOTO 850
      TOTVMT=0.
      DO 830 IV=1,MAXVEH
       VMTMIX(IV)=VCOUNT(IV)*SUM1(IV)*TFNORM(IV)
  830  TOTVMT=TOTVMT+VMTMIX(IV)
      DO 840 IV=1,MAXVEH
  840 VMTMIX(IV)=VMTMIX(IV)/TOTVMT
C
  850 DO 870 IV=1,MAXVEH
      IF(TFNORM(IV).LE.0..AND.VMTMIX(IV).GT.0.)
     *   CALL QUITER(0.,IV,48,INERR)
      IF(TFNORM(IV).LE.0.) TFNORM(IV)=1.
```

```
C
      DO 860 IDX=1,20
      JDX=21-IDX
860   TF(JDX,IV)=(TFMYM(IDX,IV)*XMYR(IDX,IV))/TFNORM(IV)
  870 CONTINUE
C
      RETURN
      END
      SUBROUTINE SPFCLX(SPARA,SPBACK)
C
C
C..PURPOSE:
C
C..SPROG COMPUTES SPEED CORRECTION FACTOR.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..SPARA   IN      VEHICLE SPEEDS
C..SPBACK  OUT     SPEED CORRECTION FACTORS
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..BIGCFX
C
C
      COMMON/ACOM/AIN(6,18,3)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      DIMENSION SPARA(8),SPBACK(18,3,8)
C
      DO 200 IV=1,MAXVEH
      S=SPARA(IV)
C
      DO 200 IP=1,MAXPOL
C
      DO 200 IG=1,18
      SCF=AIN(6,IG,IP)
C
      DO 100 IS=1,5
  100 SCF=SCF*S+AIN(6-IS,IG,IP)
      IF(IP.NE.3)SCF=EXP(SCF)
  200 SPBACK(IG,IP,IV)=SCF
C
      RETURN
      END
      FUNCTION BEF(MY,ICY,IG,IP,IV,IR,VMTAGE,EXMVAL)
C
C  BEF
C
C  REAL FUNCTION TO DETERMINE A BASIC EMISSION FACTOR.  THIS FUNCTION
C  PERFORMS CALCULATIONS PREVIOUSLY PERFORMED BY SPROG BEFGEN.
C
C
C
C  ARGUMENTS:
C
C  NAME    TYPE    DIR   DESCRIPTION
C
C  BEF      R      OUT   A REAL FUNCTION NAME THAT RETURNS A BASIC
C                        EMISSION FACTOR ADJUSTED FOR METHANE AND
C                        INSPECTION/MAINTENANCE.
C
C  MY       I       IN   MODEL YEAR.
C
C  ICY      I       IN   CALENDAR YEAR.
C
C  IG       I       IN   MODEL YEAR GROUP
C
C  IP       I       IN   AN INTEGER VARIABLE THAT CONTAINS AN EMISSION
C                        (POLLUTANT) INDEX/CODE.  VALUES ARE HC=1,
C                        CO=2, AND NOX=3.
C
C  IV       I       IN   AN INTEGER VARIABLE THAT CONTAINS A VEHICLE
C                        TYPE CODE.  IV IS CURRENTLY EXPECTED TO
C                        CONTAIN VALUES IN THE RANGE 1...8.  THIS
C                        VARIABLE WAS OFTEN CALLED IMODE IN THE
C                        MOBILE1 PROGRAM.
C
C  IR       I       IN   AN INTEGER VARIABLE THAT CONTAINS A REGION
C                        CODE.  CURRENT CODES ARE:
C
C                          1  LOW ALTITUDE
C                          2  CALIFORNIA LOW ALTITUDE
C                          3  HIGH ALTITUDE
C                          4  RESERVED FOR CALIFORNIA HIGH ALTITUDE,
C                               BUT ILLEGAL NOW
C                          5  ILLEGAL CODE FOR THIS SUBPROGRAM.
C                          6  ILLEGAL CODE FOR THIS SUBPROGRAM.
C
C  VMTAGE   R       IN   VEHICLE CUMMULATIVE MILEAGE
C
C  EXMVAL   R       IN   APPLICABLE NON-METHANE FRACTION
C
C  CALLS:
C
C       PCLEFT
C
C  CALLED BY:
C
C       EFCALX
C
C
C
```

```
C
C
C
C
      COMMON/BASECM/BASE3R(15,3,8,3)
      COMMON/DELCOM/DEL3R(15,3,8,3)
C
C
C
C
C
C
      BEF=(BASE3R(IG,IP,IV,IR)+DEL3R(IG,IP,IV,IR)*VMTAGE)*EXMVAL
C
C INSPECTION/MAINTENANCE ADJUSTMENT.
      BEF=PCLEFT(MY,ICY,IP,IV)*BEF
C
      RETURN
      END
      FUNCTION BEFIDL(IG,IP,IV,IR,VMTAGE,EXMVAL)
C
C  BEFIDL
C
C  REAL FUNCTION TO DETERMINE AN IDLE EMISSION FACTOR.  THIS FUNCTION
C  PERFORMS CALCULATIONS PREVIOUSLY PERFORMED BY SPROG BEFGEN.
C
C
C
C  ARGUMENTS:
C
C  NAME    TYPE    DIR   DESCRIPTION
C
C  BEFIDL   R     OUT   A REAL FUNCTION NAME THAT RETURNS AN IDLE
C                       EMISSION FACTOR ADJUSTED FOR METHANE, BUT
C                       NOT INSPECTION/MAINTENANCE. THIS VALUE
C                       CORRESPONDS TO ARRAY IDLBEF IN THE MOBILE1
C                       PROGRAM.  THE NAME WAS CHANGED TO ELIMINATE
C                       THE NEED TO DECLARE THE FUNCTION NAME REAL
C                       IN CALLING SOFTWARE.
C
C  IG       I       IN  MODEL YEAR GROUP
C
C  IP       I       IN  AN INTEGER VARIABLE THAT CONTAINS AN EMISSION
C                       (POLLUTANT) INDEX/CODE.  VALUES ARE HC=1,
C                       CO=2, AND NOX=3.
C
C  IV       I       IN  AN INTEGER VARIABLE THAT CONTAINS A VEHICLE
C                       TYPE CODE.  IV IS CURRENTLY EXPECTED TO
C                       CONTAIN VALUES IN THE RANGE 1...8.  THIS
C                       VARIABLE WAS OFTEN CALLED IMODE IN THE
C                       MOBILE1 PROGRAM.
C
C  IR       I       IN  AN INTEGER VARIABLE THAT CONTAINS A REGION
C                       CODE.  CURRENT CODES ARE:
C
C                         1  LOW ALTITUDE
C                         2  CALIFORNIA LOW ALTITUDE
C                         3  HIGH ALTITUDE
C                         4  RESERVED FOR CALIFORNIA HIGH ALTITUDE,
C                              BUT ILLEGAL NOW
C                         5  ILLEGAL CODE FOR THIS SUBPROGRAM.
C                         6  ILLEGAL CODE FOR THIS SUBPROGRAM.
C
C  VMTAGE   R       IN  VEHICLE CUMMULATIVE MILEAGE
C
C  EXMVAL   R       IN  APPLICABLE NON-METHANE FRACTION
C
C  CALLS:
C
C
C  CALLED BY:
C
C       EFCALX
C
C
C
C
```

```
C
      REAL IDLB3R,IDEL3R
C
      COMMON/IDLBCM/IDLB3R(15,3,8,3)
      COMMON/IDLDCM/IDEL3R(15,3,8,3)
C
C
C
      BEFIDL=(IDLB3R(IG,IP,IV,IR)+IDEL3R(IG,IP,IV,IR)*VNTAGE)*CUMMIL
C
C  NO INSPECTION/MAINTENANCE ADJUSTMENT.
C
C
      RETURN
      END
      SUBROUTINE GETCUM
C
C
C..PURPOSE:
C
C..SPROG COMPUTES AVERAGE JANUARY 1 FLEET CUMULATIVE MILEAGES.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..EFCALX
C
C
      COMMON/MYMCOM/XMYM(20,8),XMYR(20,8),TF(20,8),TFMYM(20,8)
      COMMON/CUMCOM/CUMMIL(20,8)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
C
C
      DO 100 IV=1,MAXVEH
      CUMMIL(1,IV)=XMYM(1,IV)*100000.
C
      DO 100 IDX=2,20
  100 CUMMIL(IDX,IV)=XMYM(IDX,IV)*100000.+CUMMIL(IDX-1,IV)
C
      RETURN
      END
      SUBROUTINE EFALTX(INERR)
C
C
C..PURPOSE:
C
C..SPROG ACCUMULATES USER-SUPPLIED MODIFICATION FACTORS APPLIED TO
C..THE BASIC EMISSION FACTORS AND ZEROES ALL IDLE COEFFICIENTS FOR
C..THE POLLUTANT, VEHICLE AND REGION SELECTED BY THE USER.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..INERR   I/O     TOTAL COUNT OF DATA ENTRY ERRORS
C
C
C..USES SPROGS:
C
C..QUITER
C..INDX3R
C
C
C..USED BY:
C
C..INPUT
C
C
      COMMON/ALTCOM/INTALT(5,100),R4ALT(2,100),MODFLG(100),NEWFAC
      COMMON/INDXCM/INDXYR(15,2,3,8,3)
      COMMON/BASECM/BASE3R(15,3,8,3)
      COMMON/DELCOM/DEL3R(15,3,8,3)
      COMMON/IDLBCM/IDLB3R(15,3,8,3)
      COMMON/IDLDCM/IDEL3R(15,3,8,3)
      COMMON/ALTEQU/MAXEQU
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
C
C
C
      DO 400 IFAC=1,NEWFAC
      MODFLG(IFAC)=0
      IR=INTALT(1,IFAC)
      IV=INTALT(2,IFAC)
      IP=INTALT(3,IFAC)
      NEWPTR=INDX3R(0,IP,IV,IR)
      IF(NEWPTR.NE.0) GOTO 200
      CALL QUITER(0.,IFAC,51,INERR)
      GOTO 400
  200 INDXYR(NEWPTR,1,IP,IV,IR)=INTALT(4,IFAC)
      INDXYR(NEWPTR,2,IP,IV,IR)=INTALT(5,IFAC)
      BASE3R(NEWPTR,IP,IV,IR)=R4ALT(1,IFAC)
      DEL3R(NEWPTR,IP,IV,IR)=R4ALT(2,IFAC)
      MODFLG(IFAC)=1
C
      CALL QUITER(0.,IFAC,59,INERR)
C
      DO 300 IEQU=1,MAXEQU
      IDLB3R(IEQU,IP,IV,IR)=0.
  300 IDEL3R(IEQU,IP,IV,IR)=0.
  400 CONTINUE
C
      RETURN
      END
      SUBROUTINE CCEVAX
C
C
C..PURPOSE:
C
C..THIS SUBPROGRAM ENTERS USER-SUPPLIED TRIP DATA.  ORIGINALLY,
C..THIS SUBPROGRAM ALSO COMPUTED HC CRANKCASE AND EVAPORATIVE
C..EMISSION FACTORS.  THAT CALCULATION IS NOW PERFORMED BY
C..SPROG CCEVRT.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..NONE
C
C
C..USES SPROGS:
C
C..NONE
C
C
C..USED BY:
C
C..INPUT
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/CEVCOM/USRTPD(8),USRMPD(8)
      COMMON/XMPCOM/MAXXMP,XMPVAL(2,8,3),IXMPYS(2,8,3)
      COMMON/TPDCOM/MAXTPD,TPDVAL(2,8,3),ITPDYS(2,8,3)
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/YEARS4/IY1951,IY1970,IY2020
C
C
C  SUBSTITUTE USER-SUPPLIED TRIP DATA HERE
      DO 300 IR=1,MAXREG
C
      DO 300 IV=1,MAXVEH
C
      XMPVAL(1,IV,IR)=USRMPD(IV)
      IXMPYS(1,IV,IR)=IY2020
      DO 100 I=2,MAXXMP
      XMPVAL(I,IV,IR)=0.
  100 IXMPYS(I,IV,IR)=0
C
      TPDVAL(1,IV,IR)=USRTPD(IV)
      ITPDYS(1,IV,IR)=IY2020
      DO 200 I=2,MAXTPD
      TPDVAL(I,IV,IR)=0.
  200 ITPDYS(I,IV,IR)=0
C
  300 CONTINUE
C
```

```
39058               RETURN
39059               END
```

```
      FUNCTION PCLEFT(MY,ICY,IP,IV)
C
C  PCLEFT
C
C  REAL FUNCTION TO DETERMINE AN ADJUSTMENT TO A BASIC EMISSION
C  FACTOR THAT ACCOUNTS FOR THE EFFECTS OF AN INSPECTION/MAINTENANCE
C  PROGRAM.  THIS FUNCTION REPLACES SPROG LDVIMX IN THE MOBILE2
C  PROGRAM.
C
C
C
C  ARGUMENTS:
C
C  NAME    TYPE    DIR   DESCRIPTION
C
C  PCLEFT   R      OUT   A REAL FUNCTION NAME THAT RETURNS AN
C                        INSPECTION/MAINTENANCE ADJUSTMENT TERM
C                        TO A BASIC EMISSION FACTOR.
C
C  MY       I       IN   MODEL YEAR.
C
C  ICY      I       IN   CALENDAR YEAR.
C
C  IP       I       IN   AN INTEGER VARIABLE THAT CONTAINS AN EMISSION
C                        (POLLUTANT) INDEX/CODE.  VALUES ARE HC=1,
C                        CO=2, AND NOX=3.
C
C  IV       I       IN   AN INTEGER VARIABLE THAT CONTAINS A VEHICLE
C                        TYPE CODE.  IV IS CURRENTLY EXPECTED TO
C                        CONTAIN VALUES IN THE RANGE 1...8.
C
C  CALLS:
C
C       NONE
C
C  CALLED BY:
C
C       SPROG BEF
C
C
C
      INTEGER ALTFLG,VMFLAG,ALHFLG,SPDFLG,PRTFLG
C
      COMMON/FLGCOM/ALTFLG,VMFLAG,ALHFLG,IRDFLG,SPDFLG,NMHFLG,IDLFLG
      COMMON/FLGCOM/MYMRFG,IMFLG,ICEVFG,PRTFLG,IFORM,MDEFLG
      COMMON/IMCOM/ICYIM,ISTRIN,IMTFLG,MODYR1,MODYR2
      COMMON/IMCOM/ILDT,IOPTN,NUDATA,NLINES,STRING(18,9)
      COMMON/IMCRED/IRED(19,20,5,2,2),ITECH4(19,20,5)
C
      INTEGER BY,AGE1ST
C
C
C
      PCLEFT=1.
C
C ERROR CHECK
C
      IF(IMFLG.EQ.0) GOTO 999
      IF(IV.GT.3) GOTO 999
      IF(IV.GT.1.AND.ILDT.EQ.0) GOTO 999
      IF(IP.EQ.3) GOTO 999
      IF(ICY.EQ.MY.OR.ICY.LE.ICYIM) GOTO 999
      IF(MY.LT.MODYR1.OR.MY.GT.MODYR2) GOTO 999
C
C FIND THE BENEFIT YEAR
C
      BY=ICY-ICYIM
      IF(MY.GT.ICYIM) BY=ICY-MY
      IF(BY.GT.19) BY=19
C
C FIND THE AGE OF THE VEHICLE AT FIRST INSPECTION
C
      AGE1ST=1
      IF(MY.LT.ICYIM) AGE1ST=ICYIM-MY+1
C
C DETERMINE TECHNOLOGY BY MODEL YEAR AND VEHICLE TYPE
C
      ITECH=1
      IF(IV.NE.1) GOTO 100
      IF(MY.GE.1975.AND.MY.LE.1980) ITECH=2
      IF(MY.GT.1980) ITECH=4
      GOTO 400
C
  100 IF(IV.EQ.3.OR.ILDT.EQ.2) GOTO 200
      IF(MY.GE.1975.AND.MY.LE.1984) ITECH=2
      GOTO 300
C
  200 IF(IV.EQ.2.OR.ILDT.EQ.1) GOTO 999
      IF(MY.GE.1979.AND.MY.LE.1984) ITECH=2
  300 IF(MY.GT.1984) ITECH=4
C
C REFERENCE THE RIGHT REDUCTION, INTERPOLATING BY STRINGENCY OR OPTION
C
  400 MT=IMTFLG+1
      IF(ITECH.EQ.4) GOTO 600
C
      IREM=ISTRIN-(ISTRIN/10)*10
      REM=IREM*.1
      ISTRN=(ISTRIN-IREM)/10
      IF(MT.EQ.2) GOTO 500
C
C..ITECH<4 AND MT=1
      PCRED=IRED(BY,AGE1ST,ISTRN,ITECH,IP)
      IF(ISTRN.LT.5.AND.IREM.GT.0) PCRED=
     *    (IRED(BY,AGE1ST,ISTRN+1,ITECH,IP)-PCRED)*REM+PCRED
      GOTO 800
C
C..ITECH<4 AND MT=2
  500 PCRED=IRED(20-BY,21-AGE1ST,ISTRN,ITECH,IP)
      IF(ISTRN.LT.5.AND.IREM.GT.0) PCRED=
     *    (IRED(20-BY,21-AGE1ST,ISTRN+1,ITECH,IP)-PCRED)*REM+PCRED
      GOTO 800
C
  600 IOP=IOPTN-40
      IREM=IOP-(IOP/10)*10
      REM=IREM*.1
      IOPT=(IOP-IREM)/10
C
      IF(IP.EQ.2) GOTO 700
C
C..ITECH=4 AND IP=1
      PCRED=ITECH4(BY,AGE1ST,IOPT)
      IF(IOPT.LT.5.AND.IREM.GT.0) PCRED=
     *   (ITECH4(BY,AGE1ST,IOPT+1)-PCRED)*REM+PCRED
      GOTO 800
C
C..ITECH=4 AND IP=2
  700 PCRED=ITECH4(20-BY,21-AGE1ST,IOPT)
      IF(IOPT.LT.5.AND.IREM.GT.0) PCRED=
     *   (ITECH4(20-BY,21-AGE1ST,IOPT+1)-PCRED)*REM+PCRED
C
C
  800 PCLEFT=1.-PCRED/100.
C
  999 RETURN
      END
      SUBROUTINE ALUH(ICY,IR)
C
C
C..PURPOSE:
C
C..SPROG COMPUTES EMISSION CORRECTION FACTORS FOR AIR CONDITIONING,
C..EXTRA LOADING, TRAILER TOWING AND HUMIDITY ONLY FOR VEHICLES
C..LDGV, LDGT1, LDGT2 AND LDGT (COMP.).  ADDITIONALLY, THE HUMIDITY
C..CORRECTION IS APPLIED TO MC VEHICLES.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..ICY     IN      CALENDAR YEAR
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..IGEPTR
C..IGUPTR
C..IGLPTR
C..IGTPTR
C
C
C..USED BY:
C
C..BIGCFX
C
C
      COMMON/RET1/ALHRET(20,4,3)
      COMMON/ALUCOM/ACEQIP(8,3,3),ACCF(2,3,2,3,3)
      COMMON/ALUCOM/XLCF(3,6,3,3),TWCF(3,6,3,3)
      COMMON/LNKCOM/SPD(8),TAMB,PCCN,PCHC,PCCC
      COMMON/XCFS1/AC,XLOAD(3),TRAILR(3),ABSHUM,DB,WB
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
C
C..DILO IS THE LOW REFERENCE TEMP FOR DI
C..DIHI IS THE HIGH REFERENCE TEMP FOR DI
C..DI IS THE DISCOMFORT INDEX COMPUTED FROM  THE USER SUPPLIED (DEFAULT)
C..VALUES OF DRY BULB (DB) AND WET BULB (WB) TEMPS.
C
      DATA DILO/70./
      DATA DIHI/80./
C
C
C
      IF(AC.EQ.0.) GOTO 100
C..COMPUTE AC BASED ON DISCOMFORT INDEX DI
      DI=(DB+WB)*.4+15.
      AC=(DI-DILO)/(DIHI-DILO)
      IF(AC.LT.0.) AC=0.
      IF(AC.GT.1.) AC=1.
C..SETUP HUMIDITY CORRECTION FACTORS
  100 TT=TAMB-75.
      HHH=1.-0.00470*(ABSHUM-75.)
```

```
C..ASSIGN MC ONLY FOR IP=3
      DO 200 IDX=1,20
      ALHRET(IDX,4,1)=1.
      ALHRET(IDX,4,2)=1.
  200 ALHRET(IDX,4,3)=HHH
C
C..ASSIGN OTHER VEHICLE CORRECTION FACTORS
C
      DO 400 IVP=1,MAXLTW
      XLU=XLOAD(IVP)
      TWU=TRAILR(IVP)
C
      DO 300 IDX=1,20
      MY=ICY-(20-IDX)
      IGU=IGUPTR(MY,IVP,IR)
      IGE=IGEPTR(MY,IVP,IR)
      IGL=IGLPTR(MY,IVP,IR)
      IGT=IGTPTR(MY,IVP,IR)
      ACU=ACEQIP(IGE,IVP,IR)*AC
C
      DO 300 IP=1,MAXPOL
      HH=1.
      IF(IP.EQ.3) HH=HHH
  300 ALHRET(IDX,IVP,IP)=
     *    ((ACCF(2,IP,IGU,IVP,IR)*TT+ACCF(1,IP,IGU,IVP,IR)-1.)*ACU+1.)
     *  *((XLCF(IP,IGL,IVP,IR)-1.)*XLU+1.)
     *  *((TWCF(IP,IGT,IVP,IR)-1.)*TWU+1.)
     *  *HH
C
  400 CONTINUE
C
C
      RETURN
      END
      FUNCTION IGEPTR(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO FRACTION OF VEHICLES EQUIPPED WITH A.C.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..ALUH
C
C
      COMMON/ALUPTR/IGEYRS(8,3,3),IGUYRS(2,3,3)
      COMMON/ALUPTR/IGLYRS(6,3,3),IGTYRS(6,3,3)
C
C
C
      DO 100 IG=1,8
      IF(MY.LE.IGEYRS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0..6,61,MY)
  200 IGEPTR=IG
C
      RETURN
      END
      FUNCTION IGUPTR(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO FRACTION OF VEHICLES USING A.C.
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..ALUH
C
C
      COMMON/ALUPTR/IGEYRS(8,3,3),IGUYRS(2,3,3)
      COMMON/ALUPTR/IGLYRS(6,3,3),IGTYRS(6,3,3)
C
C
C
      DO 100 IG=1,2
      IF(MY.LE.IGUYRS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,7,61,MY)
  200 IGUPTR=IG
C
      RETURN
      END
      FUNCTION IGLPTR(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO FRACTION OF VEHICLES WITH EXTRA LOAD
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..ALUM
C
C
      COMMON/ALUPTR/IGEYRS(8,3,3),IGUYRS(2,3,3)
      COMMON/ALUPTR/IGLYRS(6,3,3),IGTYRS(6,3,3)
C
C
C
      DO 100 IG=1,6
      IF(MY.LE.IGLYRS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,8,61,MY)
  200 IGLPTR=IG
C
      RETURN
      END
      FUNCTION IGTPTR(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO FRACTION OF VEHICLES WITH TRAILER IN TOW
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..ALUM
C
C
      COMMON/ALUPTR/IGEYRS(6,3,2),IGUYRS(6,3,2)
      COMMON/ALUPTR/IGLYRS(6,3,2),IGTYRS(6,3,2)
C
C
C
      DO 100 IG=1,6
      IF(MY.LE.IGTYRS(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,0,61,MY)
  200 IGTPTR=IG
C
      RETURN
      END
      FUNCTION IGPPTR(MY,IP,IR,IV)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO SPEED CORRECTION COEFFICIENTS
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IP      IN      POLLUTANT NUMBER
C..IR      IN      REGION NUMBER
C..IV      IN      VEHICLE TYPE
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..BIGCFX
C
C
      COMMON/PTRCOM/MAXIGP,IGPYRS(9,3,3,8)
C
C
C
      DO 100 IG=1,MAXIGP
      IF(MY.LE.IGPYRS(IG,IP,IR,IV)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,10,61,MY)
  200 IGPPTR=IG
C
      RETURN
      END
      FUNCTION INDX3R(MY,IP,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER FOR INTERCEPT AND SLOPE OF EMISSION EQUATION
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR (MY=0 FOR EFALTX SEEKING A NEW SLOT)
C..IP      IN      POLLUTANT NUMBER
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..EFCALX
C..EFALTX
C
C
      COMMON/INDXCM/INDXYR(15,2,3,8,3)
C
C
C
      DO 100 IG=1,15
      JG=IG
      IF(MY.GT.0) JG=16-IG
      IF(MY.GE.INDXYR(JG,1,IP,IV,IR).AND.
     *   MY.LE.INDXYR(JG,2,IP,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      JG=0
      IF(MY.EQ.0) GOTO 200
      JG=1
      CALL QUITER(0.,11,61,MY)
C
  200 INDX3R=JG
      RETURN
      END
      FUNCTION ISPPTR(MY,IR,IV)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO BAG SPEED NORMALIZATION COEFFICIENTS (IV=1,2,3,5,6)
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..BIGCFX
C
C
      COMMON/ISPCOM/ISPYRS(18,3,3),ISPYR8(18,3,3)
C
C
C
      DO 100 IG=1,18
      IF(MY.LE.ISPYRS(IG,IR,IV)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,12,61,MY)
  200 ISPPTR=IG
C
      RETURN
      END
      FUNCTION ISPPT8(MY,IR,IP)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO BAG SPEED NORMALIZATION COEFFICIENTS FOR MC (IV=8)
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IP      IN      POLLUTANT NUMBER
C..IR      IN      REGION NUMBER
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..BIGCFX
C
C
      COMMON/ISPCOM/ISPYRS(18,3,3),ISPYR8(18,3,3)
C
C
C
      DO 100 IG=1,18
      IF(MY.LE.ISPYR8(IG,IR,IP)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,13,61,MY)
  200 ISPPT8=IG
C
      RETURN
      END
      FUNCTION IEXMPT(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO NON-METHANE FRACTIONS
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..EFCALX
C
C
      COMMON/BEFGCM/EXMETH(3,8,3),IEXMYR(3,8,3)
C
C
C
      DO 100 IG=1,3
      IF(MY.LE.IEXMYR(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,14,61,MY)
  200 IEXMPT=IG
C
      RETURN
      END
      FUNCTION IGSFPT(MY,IV,IR)
C
C
C..PURPOSE:
C
C..SELECT POINTER TO GROSS SALES FRACTION
C
C
C..ARGUMENTS:
C
C..NAME    USAGE   DESCRIPTION
C
C..MY      IN      MODEL YEAR
C..IV      IN      VEHICLE TYPE
C..IR      IN      REGION
C
C
C..USES SPROGS:
C
C..QUITER
C
C
C..USED BY:
C
C..EFCALX
C..REGMOD
C
C
      COMMON/GSFCOM/MAXGSF,GSF(18,8,3),IGSFYR(18,8,3)
C
C
C
      DO 100 IG=1,MAXGSF
      IF(MY.LE.IGSFYR(IG,IV,IR)) GOTO 200
  100 CONTINUE
C
C..SET DEFAULT
C
      IG=1
      CALL QUITER(0.,16,61,MY)
  200 IGSFPT=IG
C
      RETURN
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 1
C
      COMMON/ACOM/AIN1(6,18),AIN2(6,18),AIN3(6,18)
C
C..AIN ( I, IG, IP )
C
C..SPEED CORRECTION FACTOR COEFICIENTS FOR LIGHT DUTY
C..VEHICLES & TRUCKS ( 18 GROUPS )
C
      DIMENSION A11(6,9),A12(6,9),A21(6,9),A22(6,9),A31(6,9),A32(6,9)
      EQUIVALENCE
     *(AIN1(1,1),A11(1,1)),(AIN1(1,10),A12(1,1)),
     *(AIN2(1,1),A21(1,1)),(AIN2(1,10),A22(1,1)),
     *(AIN3(1,1),A31(1,1)),(AIN3(1,10),A32(1,1))
C
C..HC SPEED CORRECTION FACTOR COEFFICIENTS
      DATA A11/
     *    2.24612E+00,  -2.90973E-01,   1.58890E-02,
     *                  -4.72494E-04,   6.94077E-06,  -3.92798E-08,
     *    2.31026E+00,  -2.89572E-01,   1.52990E-02,
     *                  -4.46689E-04,   6.48183E-06,  -3.63456E-08,
     *    2.16556E+00,  -2.69992E-01,   1.44221E-02,
     *                  -4.33638E-04,   6.50735E-06,  -3.78100E-08,
     *    2.39726E+00,  -2.99985E-01,   1.61351E-02,
     *                  -4.87491E-04,   7.29093E-06,  -4.19769E-08,
     *    2.40873E+00,  -3.08187E-01,   1.68168E-02,
     *                  -5.06843E-04,   7.53855E-06,  -4.31596E-08,
     *    2.23217E+00,  -2.84985E-01,   1.53833E-02,
     *                  -4.56738E-04,   6.73486E-06,  -3.83798E-08,
     *    2.25223E+00,  -2.87778E-01,   1.56820E-02,
     *                  -4.73179E-04,   7.07954E-06,  -4.08456E-08,
     *    2.02779E+00,  -2.73049E-01,   1.53577E-02,
     *                  -4.60304E-04,   6.78527E-06,  -3.84880E-08,
     *    2.15056E+00,  -2.83620E-01,   1.53836E-02,
     *                  -4.42136E-04,   6.28732E-06,  -3.46311E-08/
      DATA A12/
     *    2.23021E+00,  -2.93648E-01,   1.62356E-02,
     *                  -4.84148E-04,   7.11591E-06,  -4.02861E-08,
     *    2.12230E+00,  -2.91072E-01,   1.69089E-02,
     *                  -5.26148E-04,   8.02705E-06,  -4.70117E-08,
     *    2.15361E+00,  -2.83451E-01,   1.56948E-02,
     *                  -4.69759E-04,   6.93832E-06,  -3.94707E-08,
     *    2.07346E+00,  -2.89353E-01,   1.73042E-02,
     *                  -5.54707E-04,   8.64204E-06,  -5.13107E-08,
     *    2.34948E+00,  -3.04959E-01,   1.68416E-02,
     *                  -5.09623E-04,   7.59516E-06,  -4.34963E-08,
     *    2.11340E+00,  -2.85676E-01,   1.63180E-02,
     *                  -5.00793E-04,   7.55067E-06,  -4.37187E-08,
     *    2.11940E+00,  -2.98632E-01,   1.84473E-02,
     *                  -6.16544E-04,   9.92062E-06,  -6.04021E-08,
     *    2.68382E+00,  -3.44633E-01,   1.95417E-02,
     *                  -6.25720E-04,   9.78442E-06,  -5.83369E-08,
     *    2.39540E+00,  -3.35781E-01,   2.11609E-02,
     *                  -7.31550E-04,   1.20715E-05,  -7.48567E-08/
C
C..CO SPEED CORRECTION FACTOR COEFFICIENTS
```

```
      DATA A21/
     *     1.81978E+00,  -2.54663E-01,   1.52347E-02,
     *                   -4.87397E-04,   7.58207E-06,  -4.49514E-08,
     *     2.33989E+00,  -2.96978E-01,   1.60071E-02,
     *                   -4.77396E-04,   7.06752E-06,  -4.03978E-08,
     *     2.44154E+00,  -2.91473E-01,   1.42949E-02,
     *                   -3.87852E-04,   5.29781E-06,  -2.82441E-08,
     *     2.46551E+00,  -3.05023E-01,   1.60497E-02,
     *                   -4.73969E-04,   6.99075E-06,  -3.99758E-08,
     *     2.77804E+00,  -3.19130E-01,   1.53183E-02,
     *                   -4.22327E-04,   5.84948E-06,  -3.14969E-08,
     *     2.78899E+00,  -3.27107E-01,   1.62943E-02,
     *                   -4.67573E-04,   6.71906E-06,  -3.74401E-08,
     *     2.70743E+00,  -3.31038E-01,   1.76179E-02,
     *                   -5.38583E-04,   8.17402E-06,  -4.77803E-08,
     *     1.86919E+00,  -2.76679E-01,   1.72335E-02,
     *                   -5.58279E-04,   8.71678E-06,  -5.16980E-08,
     *     1.82133E+00,  -2.72054E-01,   1.70304E-02,
     *                   -5.52021E-04,   8.62543E-06,  -5.11440E-08/
      DATA A22/
     *     2.01421E+00,  -2.95188E-01,   1.86353E-02,
     *                   -6.21606E-04,   9.93657E-06,  -5.99779E-08,
     *     2.04533E+00,  -3.10618E-01,   2.04852E-02,
     *                   -7.08527E-04,   1.16215E-05,  -7.15690E-08,
     *     2.31868E+00,  -3.41147E-01,   2.09446E-02,
     *                   -6.65891E-04,   1.02225E-05,  -5.98265E-08,
     *     2.57522E+00,  -3.28888E-01,   1.89747E-02,
     *                   -6.28263E-04,   1.00924E-05,  -6.12727E-08,
     *     2.68454E+00,  -3.32817E-01,   1.76277E-02,
     *                   -5.24123E-04,   7.72221E-06,  -4.37025E-08,
     *     2.15487E+00,  -3.29116E-01,   2.10112E-02,
     *                   -6.89057E-04,   1.08390E-05,  -6.47125E-08,
     *     2.54557E+00,  -3.62954E-01,   2.32775E-02,
     *                   -8.15039E-04,   1.36231E-05,  -8.55909E-08,
     *     2.83929E+00,  -3.68756E-01,   2.10782E-02,
     *                   -6.76438E-04,   1.06267E-05,  -6.36405E-08,
     *     2.48747E+00,  -3.91562E-01,   2.70721E-02,
     *                   -9.76178E-04,   1.65270E-05,  -1.04317E-07/
C
C..NOX SPEED CORRECTION FACTOR COEFFICIENTS
      DATA A31/
     *     2.44424E+00,  -2.50107E-01,   1.38293E-02,
     *                   -2.87025E-04,   2.07585E-06,   0.00000E+00,
     *     1.68635E+00,  -1.18303E-01,   6.54975E-03,
     *                   -1.37139E-04,   1.00849E-06,   0.00000E+00,
     *     1.12646E+00,  -3.93405E-02,   2.68637E-03,
     *                   -6.08024E-05,   4.77286E-07,   0.00000E+00,
     *     1.22677E+00,  -4.44978E-02,   2.62476E-03,
     *                   -5.67150E-05,   4.34293E-07,   0.00000E+00,
     *     1.01743E+00,  -1.18958E-02,   9.14365E-04,
     *                   -2.15740E-05,   1.82300E-07,   0.00000E+00,
     *     9.87600E-01,  -1.95674E-02,   1.69645E-03,
     *                   -4.04000E-05,   3.28001E-07,   0.00000E+00,
     *     1.15917E+00,  -4.44536E-02,   2.96425E-03,
     *                   -6.68990E-05,   5.22365E-07,   0.00000E+00,
     *     1.88656E+00,  -1.61289E-01,   9.04995E-03,
     *                   -1.85609E-04,   1.32555E-06,   0.00000E+00,
     *     1.55777E+00,  -1.13032E-01,   6.71832E-03,
     *                  -1.43409E-04,  1.06079E-06,    0.00000E+00/
      DATA A32/
     *    2.04516E+00, -1.94014E-01,  1.10736E-02,
     *                  -2.31754E-04,  1.68372E-06,    0.00000E+00,
     *    1.63262E+00, -1.21861E-01,  7.03020E-03,
     *                  -1.46293E-04,  1.06141E-06,    0.00000E+00,
     *    1.44825E+00, -1.22444E-01,  7.95024E-03,
     *                  -1.71078E-04,  1.25777E-06,    0.00000E+00,
     *    2.45969E-01,  8.41954E-02, -3.40841E-03,
     *                   6.29880E-05, -4.13975E-07,    0.00000E+00,
     *    1.28169E+00, -8.04874E-02,  5.35735E-03,
     *                  -1,18891E-04,  9.01060E-07,    0.00000E+00,
     *    1.53447E+00, -1.25671E-01,  7.85919E-03,
     *                  -1.69428E-04,  1.25494E-06,    0.00000E+00,
     *    7.04805E-01,  3.81527E-02, -1.73907E-03,
     *                   3.26140E-05, -2.03847E-07,    0.00000E+00,
     *    7.83838E-01,  3.28549E-04,  1.06029E-03,
     *                  -3.19350E-05,  2.90389E-07,    0.00000E+00,
     *    9.42131E-01, -4.23240E-02,  3.86253E-03,
     *                  -9.39853E-05,  7.53883E-07,    0.00000E+00/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 2
C
      COMMON/MYMSAV/SAVMYM(20,8),SAVMYR(20,8)
      COMMON/VMXCOM/VMTMIX(8)
C
C..SAVMYM ( IDX, IV )
C..SAVMYR ( IDX, IV )
C..VMTMIX ( IV )
C
C..DEFAULT VEH. MILES TRAVELED MIX
C
      DATA VMTMIX/
     *    0.7824,0.0825,0.0468,0.0419,0.0021,0.0004,0.0354,0.0085/
C
C..ANNUAL AVERAGE MILEAGE ACCUMULATION (DIVIDED BY 100000)
C
      DATA SAVMYM/
C..LDGV
     *0.144,0.139,0.134,0.128,0.123,0.118,0.112,0.107,0.102,0.096,
     *0.091,0.086,0.080,0.075,0.070,0.064,0.059,0.054,0.049,0.043,
C..LDGT1
     *0.156,0.140,0.125,0.112,0.101,0.094,0.086,0.080,0.075,0.070,
     *0.066,0.062,0.059,0.055,0.052,0.050,0.047,0.044,0.044,0.044,
C..LDGT2
     *0.158,0.142,0.126,0.114,0.103,0.095,0.087,0.081,0.076,0.071,
     *0.066,0.063,0.060,0.055,0.052,0.051,0.047,0.044,0.044,0.044,
C..HDGV
     *0.210,0.189,0.172,0.155,0.141,0.126,0.113,0.103,0.094,0.086,
     *0.080,0.073,0.067,0.063,0.059,0.055,0.052,0.050,0.050,0.050,
C..LDDV
     *0.144,0.139,0.134,0.128,0.123,0.118,0.112,0.107,0.102,0.096,
     *0.091,0.086,0.080,0.075,0.070,0.064,0.059,0.054,0.049,0.043,
C..LDDT
     *0.157,0.151,0.146,0.140,0.130,0.121,0.110,0.097,0.093,0.074,
     *0.068,0.061,0.055,0.050,0.046,0.042,0.038,0.031,0.031,0.031,
C..HDDV
     *0.704,0.669,0.606,0.542,0.479,0.437,0.394,0.366,0.345,0.331,
     *0.324,0.317,0.310,0.296,0.275,0.246,0.204,0.176,0.176,0.176,
C..MC
     *0.041,0.028,0.021,0.016,0.012,0.008,0.006,0.004,0.002,0.002,
     *0.002,0.000,0.000,0.000,0.000.0.000,0.000,0.000,0.000,0.000/
C
C..VEHICLE REGISTRATION DISTRIBUTIONS (ENTER UNMODIFIED DATA)
      DATA SAVMYR/
C..LDGV
     *.0721,.1009,.0921,.0708,.0916,.1026,.0888,.0712,.0659,.0591,
     *.0478,.0349,.0300,.0230,.0150,.0099,.0055,.0025,.0017,.0146,
C..LDGT1
     *.0968,.0945,.0855,.0613,.0909,.0993,.0759,.0599,.0438,.0482,
     *.0457,.0332,.0350,.0330,.0261,.0214,.0152,.0114,.0104,.0125,
C..LDGT2
     *.2448,.2070,.1553,.0970,.0572,.0560,.0391,.0296,.0231,.0201,
     *.0173,.0112,.0097,.0080,.0054,.0055,.0045,.0028,.0026,.0038,
C..HDGV
     *.1276,.1139,.0974,.0735,.0858,.0882,.0705,.0534,.0413,.0439,
     *.0396,.0306,.0299,.0261,.0206,.0177,.0129,.0092,.0082,.0097,
C..LDDV
     *.0721,.1009,.0921,.0708,.0916,.1026,.0888,.0712,.0659,.0591,
     *.0478,.0349,.0300,.0230,.0150,.0099,.0055,.0025,.0017,.0146,
C..LDDT
     *.0968,.0945,.0855,.0613,.0909,.0993,.0759,.0599,.0438,.0482,
     *.0457,.0332,.0350,.0330,.0261,.0214,.0152,.0114,.0104,.0125,
C..HDDV
     *.1774,.1418,.0853,.0536,.0984,.0933,.0720,.0515,.0421,.0417,
     *.0309,.0235,.0253,.0193,.0129,.0095,.0070,.0038,.0038,.0069,
C..MC
     *0.133,0.145,0.138,0.116,0.123,0.114,0.069,0.044,0.024,0.009,
     *0.085,0.0  ,0.0  ,0.0  ,0.0  ,0.0  ,0.0  ,0.0  ,0.0  ,0.0  /
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 3
C
      COMMON/INDXCM/INDX49,INDXCA,INDXHI
C
C..INDXYR ( IG, ID, IP, IV, IR ) , ID=1 FOR FIRST YEAR OF MOD YR GROUP
C..                                   2 FOR LAST    "  "   "  "   "
C
      DIMENSION
     *    INDXYR(15,2,3,8,3),
     *    INDX49(15,2,3,8),
     *    INDXCA(15,2,3,8),
     *    INDXHI(15,2,3,8)
      EQUIVALENCE
     *    (INDXYR(1,1,1,1,1),INDX49(1,1,1,1)),
     *    (INDXYR(1,1,1,1,2),INDXCA(1,1,1,1)),
     *    (INDXYR(1,1,1,1,3),INDXHI(1,1,1,1))
C
      DIMENSION
     *    IN49V1(15,2,3),
     *    IN49V2(15,2,3),
     *    IN49V3(15,2,3),
     *    IN49V4(15,2,3),
     *    IN49V5(15,2,3),
     *    IN49V6(15,2,3),
     *    IN49V7(15,2,3),
     *    IN49V8(15,2,3)
      EQUIVALENCE
     *    (INDX49(1,1,1,1),IN49V1(1,1,1)),
     *    (INDX49(1,1,1,2),IN49V2(1,1,1)),
     *    (INDX49(1,1,1,3),IN49V3(1,1,1)),
     *    (INDX49(1,1,1,4),IN49V4(1,1,1)),
     *    (INDX49(1,1,1,5),IN49V5(1,1,1)),
     *    (INDX49(1,1,1,6),IN49V6(1,1,1)),
     *    (INDX49(1,1,1,7),IN49V7(1,1,1)),
     *    (INDX49(1,1,1,8),IN49V8(1,1,1))
C
      DIMENSION
     *    INCAV1(15,2,3),
     *    INCAV2(15,2,3),
     *    INCAV3(15,2,3),
     *    INCAV4(15,2,3),
     *    INCAV5(15,2,3),
     *    INCAV6(15,2,3),
     *    INCAV7(15,2,3),
     *    INCAV8(15,2,3)
      EQUIVALENCE
     *    (INDXCA(1,1,1,1),INCAV1(1,1,1)),
     *    (INDXCA(1,1,1,2),INCAV2(1,1,1)),
     *    (INDXCA(1,1,1,3),INCAV3(1,1,1)),
     *    (INDXCA(1,1,1,4),INCAV4(1,1,1)),
     *    (INDXCA(1,1,1,5),INCAV5(1,1,1)),
     *    (INDXCA(1,1,1,6),INCAV6(1,1,1)),
     *    (INDXCA(1,1,1,7),INCAV7(1,1,1)),
     *    (INDXCA(1,1,1,8),INCAV8(1,1,1))
C
      DIMENSION
     *   INHIV1(15,2,3),
     *   INHIV2(15,2,3),
     *   INHIV3(15,2,3),
     *   INHIV4(15,2,3),
     *   INHIV5(15,2,3),
     *   INHIV6(15,2,3),
     *   INHIV7(15,2,3),
     *   INHIV8(15,2,3)
      EQUIVALENCE
     *   (INDXHI(1,1,1,1),INHIV1(1,1,1)),
     *   (INDXHI(1,1,1,2),INHIV2(1,1,1)),
     *   (INDXHI(1,1,1,3),INHIV3(1,1,1)),
     *   (INDXHI(1,1,1,4),INHIV4(1,1,1)),
     *   (INDXHI(1,1,1,5),INHIV5(1,1,1)),
     *   (INDXHI(1,1,1,6),INHIV6(1,1,1)),
     *   (INDXHI(1,1,1,7),INHIV7(1,1,1)),
     *   (INDXHI(1,1,1,8),INHIV8(1,1,1))
C
C..FIRST & LAST YEARS OF MODEL YEAR GROUPS FOR FTP & IDLE
C..EMISSION RATES
C
      DATA IN49V1/
C..HC
     *   1951,1968,1970,1972,1975,1980,1981,1982,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1967,1969,1971,1974,1979,1980,1981,2020,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1968,1970,1972,1975,1980,1981,1982,1983,0000,
     *   0000,0000,0000,0000,0000,
     *   1967,1969,1971,1974,1979,1980,1981,1982,2020,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1968,1973,1975,1977,1980,1981,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1967,1972,1974,1976,1979,1980,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN49V2/
C..HC
     *   1951,1968,1970,1972,1975,1979,1981,1982,1984,1985,
     *   0000,0000,0000,0000,0000,
     *   1967,1969,1971,1974,1978,1980,1981,1983,1984,2020,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1968,1970,1972,1975,1979,1981,1982,1984,1985,
     *   0000,0000,0000,0000,0000,
     *   1967,1969,1971,1974,1978,1980,1981,1983,1984,2020,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1968,1973,1975,1979,1982,1984,1985,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1967,1972,1974,1978,1981,1983,1984,2020,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN49V3/
```

```
C...HC
     *   1951,1970,1974,1979,1981,1982,1984,1985,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1973,1978,1980,1981,1983,1984,2020,0000,0000,
     *   0000,0000,0000,0000,0000,
C...CO
     *   1951,1970,1974,1979,1981,1982,1984,1985,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1973,1978,1980,1981,1983,1984,2020,0000,0000,
     *   0000,0000,0000,0000,0000,
C...NOX
     *   1951,1970,1974,1979,1982,1984,1985,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1973,1978,1981,1983,1984,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN4GV4/
C...HC
     *   1951,1970,1974,1979,1984,1985,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C...CO
     *   1951,1970,1974,1979,1984,1985,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C...NOX
     *   1951,1970,1974,1979,1984,1985,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN4GV5/
C...HC
     *   1951,1975,1977,1978,1979,1980,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C...CO
     *   1951,1975,1977,1978,1979,1980,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C...NOX
     *   1951,1975,1977,1978,1979,1980,1981,1982,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1974,1976,1977,1978,1979,1980,1981,2020,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN4GV6/
C...HC
     *   1978,1979,1980,1983,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1979,1982,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1978,1979,1980,1983,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1979,1982,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1978,1979,1980,1985,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1979,1984,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN49V7/
C..HC
     *   1951,1985,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1984,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1985,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1984,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1985,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1984,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA IN49V8/
C..HC
     *   1951,1978,1980,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1978,1980,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1978,1980,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV1/
C..HC
     *   1951,1966,1968,1970,1972,1975,1977,1980,1981,1983,
     *   0000,0000,0000,0000,0000,
     *   1965,1967,1969,1971,1974,1976,1979,1980,1982,2020,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1966,1968,1970,1972,1975,1977,1980,1981,1983,
     *   0000,0000,0000,0000,0000,
     *   1965,1967,1969,1971,1974,1976,1979,1980,1982,2020,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1966,1971,1974,1975,1977,1980,1981,1983,0000,
     *   0000,0000,0000,0000,0000,
     *   1965,1970,1973,1974,1976,1979,1980,1982,2020,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV2/
C..HC
     *   1951,1966,1968,1970,1972,1975,1976,1979,1980,1981,
     *   1983,0000,0000,0000,0000,
     *   1965,1967,1969,1971,1974,1975,1978,1979,1980,1982,
     *   2020,0000,0000,0000,0000,
C..CO
     *   1951,1966,1968,1970,1972,1975,1976,1979,1981,1983,
     *   0000,0000,0000,0000,0000,
     *   1965,1967,1969,1971,1974,1975,1978,1980,1982,2020,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1966,1971,1974,1975,1979,1981,1983,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1965,1970,1973,1974,1978,1980,1982,2020,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV3/
C..HC
     *   1951,1969,1972,1973,1975,1977,1978,1981,1983,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1971,1972,1974,1976,1977,1980,1982,2020,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1969,1972,1973,1975,1977,1978,1981,1983,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1971,1972,1974,1976,1977,1980,1982,2020,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1969,1972,1973,1975,1977,1978,1981,1983,0000,
     *   0000,0000,0000,0000,0000,
     *   1969,1971,1972,1974,1976,1977,1980,1982,2020,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV4/
C..HC
     *   1951,1969,1972,1973,1975,1977,1980,1984,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1968,1971,1972,1974,1976,1979,1983,2020,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1969,1972,1973,1975,1977,1980,1984,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1968,1971,1972,1974,1976,1979,1983,2020,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1969,1972,1973,1975,1977,1980,1984,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1968,1971,1972,1974,1976,1979,1983,2020,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV5/
C..HC
     *   1951,1975,1977,1978,1979,1980,1982,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1974,1976,1977,1978,1979,1981,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1975,1977,1978,1979,1980,1982,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1974,1976,1977,1978,1979,1981,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1975,1977,1978,1979,1980,1982,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1974,1976,1977,1978,1979,1981,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV6/
C..HC
     *   1951,1979,1981,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1980,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1979,1981,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1980,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1979,1981,1983,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1980,1982,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INCAV7/
C..HC
     *   1951,1984,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1983,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1984,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1983,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1977,1980,1984,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1976,1979,1983,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
```

```
C
      DATA INCAV8/
C..HC
     *   1951,1978,1980,1982,1984,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,1981,1983,2020,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1978,1980,1982,1984,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,1981,1983,2020,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1978,1980,1982,1984,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,1981,1983,2020,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INHIV1/
C..HC
     *   1951,1968,1970,1972,1975,1977,1978,1980,1981,1982,
     *   1983,1984,0000,0000,0000,
     *   1967,1969,1971,1974,1976,1977,1979,1980,1981,1982,
     *   1983,2020,0000,0000,0000,
C..CO
     *   1951,1968,1970,1972,1975,1977,1978,1980,1981,1982,
     *   1983,1984,0000,0000,0000,
     *   1967,1969,1971,1974,1976,1977,1979,1980,1981,1982,
     *   1983,2020,0000,0000,0000,
C..NOX
     *   1951,1968,1973,1975,1977,1978,1980,1981,1982,1983,
     *   1984,0000,0000,0000,0000,
     *   1967,1972,1974,1976,1977,1979,1980,1981,1982,1983,
     *   2020,0000,0000,0000,0000/
C
C
      DATA INHIV2/
C..HC
     *   1951,1968,1970,1972,1975,1977,1978,1979,1981,1982,
     *   1983,1984,1985,0000,0000,
     *   1967,1969,1971,1974,1976,1977,1978,1980,1981,1982,
     *   1983,1984,2020,0000,0000,
C..CO
     *   1951,1968,1970,1972,1975,1977,1978,1979,1981,1982,
     *   1983,1984,1985,0000,0000,
     *   1967,1969,1971,1974,1976,1977,1978,1980,1981,1982,
     *   1983,1984,2020,0000,0000,
C..NOX
     *   1951,1968,1973,1975,1977,1978,1979,1981,1982,1984,
     *   1985,0000,0000,0000,0000,
     *   1967,1972,1974,1976,1977,1978,1980,1981,1983,1984,
     *  2020,0000,0000,0000,0000/
C
C
      DATA INHIV3/
C..HC
     *   1951,1970,1974,1979,1981,1982,1983,1984,1985,0000,
     *    0000,0000,0000,0000,0000,
     *    1969,1973,1978,1980,1981,1982,1983,1984,2020,0000,
     *    0000,0000,0000,0000,0000,
C..CO
     *    1951,1970,1974,1979,1981,1982,1983,1984,1985,0000,
     *    0000,0000,0000,0000,0000,
     *    1969,1973,1978,1980,1981,1982,1983,1984,2020,0000,
     *    0000,0000,0000,0000,0000,
C..NOX
     *    1951,1970,1974,1979,1981,1982,1984,1985,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1969,1973,1978,1980,1981,1983,1984,2020,0000,0000,
     *    0000,0000,0000,0000,0000/
C
C
      DATA INHIV4/
C..HC
     *    1951,1970,1974,1979,1984,1985,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1969,1973,1978,1983,1984,2020,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
C..CO
     *    1951,1970,1974,1979,1984,1985,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1969,1973,1978,1983,1984,2020,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
C..NOX
     *    1951,1970,1974,1979,1984,1985,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1969,1973,1978,1983,1984,2020,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000/
C
C
      DATA INHIV5/
C..HC
     *    1951,1975,1977,1978,1979,1980,1982,1984,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1974,1976,1977,1978,1979,1981,1983,2020,0000,0000,
     *    0000,0000,0000,0000,0000,
C..CO
     *    1951,1975,1977,1978,1979,1980,1982,1984,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1974,1976,1977,1978,1979,1981,1983,2020,0000,0000,
     *    0000,0000,0000,0000,0000,
C..NOX
     *    1951,1975,1977,1978,1979,1980,1981,1983,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1974,1976,1977,1978,1979,1980,1982,2020,0000,0000,
     *    0000,0000,0000,0000,0000/
C
C
      DATA INHIV6/
C..HC
     *    1978,1979,1980,1984,0000,0000,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
     *    1978,1979,1983,2020,0000,0000,0000,0000,0000,0000,
     *    0000,0000,0000,0000,0000,
C..CO
```

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     *   1978,1979,1980,1984,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1979,1983,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1978,1979,1980,1985,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1978,1979,1984,2020,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INHIV7/
C..HC
     *   1951,1985,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1984,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1985,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1984,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1985,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1984,2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
C
      DATA INHIV8/
C..HC
     *   1951,1978,1980,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..CO
     *   1951,1978,1980,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
C..NOX
     *   1951,1978,1980,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 4
C
      COMMON/BASECM/BASE49,BASECA,BASEHI
      COMMON/DELCOM/DEL49,DELCA,DELHI
C
C..BASE3R ( IG, IP, IV, IR )
C..DEL3R ( IG, IP, IV, IR )
C
C
      DIMENSION
     *   BASE3R(15,3,8,3),
     *   BASE49(15,3,8),
     *   BASECA(15,3,8),
     *   BASEHI(15,3,8)
      EQUIVALENCE
     *    (BASE3R(1,1,1,1),BASE49(1,1,1)),
     *    (BASE3R(1,1,1,2),BASECA(1,1,1)),
     *    (BASE3R(1,1,1,3),BASEHI(1,1,1))
C
      DIMENSION B41(15,3,4),B42(15,3,4)
      EQUIVALENCE(BASE49(1,1,1),B41(1,1,1)),(BASE49(1,1,5),B42(1,1,1))
      DIMENSION BC1(15,3,4),BC2(15,3,4)
      EQUIVALENCE(BASECA(1,1,1),BC1(1,1,1)),(BASECA(1,1,5),BC2(1,1,1))
      DIMENSION BH1(15,3,4),BH2(15,3,4)
      EQUIVALENCE(BASEHI(1,1,1),BH1(1,1,1)),(BASEHI(1,1,5),BH2(1,1,1))
C
C
      DIMENSION
     *   DEL3R(15,3,8,3),
     *   DEL49(15,3,8),
     *   DELCA(15,3,8),
     *   DELHI(15,3,8)
      EQUIVALENCE
     *    (DEL3R(1,1,1,1),DEL49(1,1,1)),
     *    (DEL3R(1,1,1,2),DELCA(1,1,1)),
     *    (DEL3R(1,1,1,3),DELHI(1,1,1))
C
      DIMENSION D41(15,3,4),D42(15,3,4)
      EQUIVALENCE(DEL49(1,1,1),D41(1,1,1)),(DEL49(1,1,5),D42(1,1,1))
      DIMENSION DC1(15,3,4),DC2(15,3,4)
      EQUIVALENCE(DELCA(1,1,1),DC1(1,1,1)),(DELCA(1,1,5),DC2(1,1,1))
      DIMENSION DH1(15,3,4),DH2(15,3,4)
      EQUIVALENCE(DELHI(1,1,1),DH1(1,1,1)),(DELHI(1,1,5),DH2(1,1,1))
C
C..FTP EXHAUST EMISSION ZERO MILEAGE EMISSION & DETERIORATION
C..(PER 10K MILES) RATES.   1 LINE PER POL. FOR EACH VEH.TYPE
C
C..ZERO MILE (BASE) RATES
C..LOW ALT. 49-STATE
C
      DATA B41/
C..LDGV
     * [illegible]
     * [illegible]
     * [illegible]
C..LDGT1
```

```
     * 7.25, 4.43, 3.00, 3.36, 1.84, 0.99, 0.89, 0.88, 0.58, 0.41,5*0.0,
     *78.27,56.34,42.17,40.78,24.91,13.92,11.85,11.44, 6.14, 3.01,5*0.0,
     * 3.44, 4.35, 2.87, 2.95, 1.85, 1.90, 1.42, 0.59,7*0.0,
C..LDGT2
     * 9.57, 6.06, 6.06, 0.99, 0.89, 0.88, 0.58, 0.41,7*0.0,
     *93.98,57.09,57.09,13.92,11.85,11.44, 6.14, 3.01,7*0.0,
     * 5.44, 6.45, 4.61, 1.85, 1.90, 1.42, 0.59,8*0.0,
C..HDGV
     *18.26,11.09,11.09, 4.88, 1.62, 1.16,9*0.0,
     *227.63,190.20,190.20,144.67,15.82,7.75,9*0.,
     * 8.88,11.40, 9.45, 9.45,11.33, 1.88,9*0.00/
      DATA B42/
C..LDDV
     * 1.31, 0.43, 0.51, 0.81, 0.71, 0.39, 9*0.,
     * 2.71, 1.20, 1.39, 1.46, 1.52, 1.27, 9*0.,
     * 1.46, 1.77, 1.33, 1.62, 1.46, 1.49, 1.11, 0.75, 7*0.,
C..LDDT
     * 0.94, 0.85, 0.85, 0.61,11*0.,
     * 1.80, 2.06, 1.98, 1.98,11*0.,
     * 1.75, 1.77, 1.89, 0.71,11*0.,
C..HDDV
     * 3.49, 2.65,13*0.,
     *10.91,10.91,13*0.,
     *22.90, 5.43,13*0.,
C..MC
     * 8.90, 3.40, 2.70,12*0.,
     *34.30,23.10,18.50,12*0.,
     * 0.20, 0.65, 0.85,12*0./
C
C..CALIFORNIA
      DATA BC1/
C..LDGV
     * 9.58, 4.84, 4.31, 3.70, 3.02, 0.55, 0.32, 0.41, 0.46, 0.46,5*0.0,
     *79.31,57.41,53.75,46.43,33.29, 8.39, 4.68, 7.04, 7.29, 7.29,5*0.0,
     * 2.93, 4.06, 3.40, 2.20, 2.03, 1.51, 0.84, 0.56, 0.37,6*0.0,
C..LDGT1
     * 9.58, 4.84, 4.31, 3.70, 3.02, 1.22, 0.55, 0.37, 0.36, 0.48,
     * 0.55,4*0.0,
     *79.31,57.41,53.75,46.43,33.29,18.64,15.85, 4.68, 7.04, 8.46,5*0.0,
     * 2.93, 4.06, 3.40, 2.20, 2.03, 1.85, 1.13, 0.62,7*0.0,
C..LDGT2
     * 9.57, 6.06, 6.06, 6.06, 3.79, 3.22, 0.55, 0.52, 0.59,6*0.0,
     *93.98,57.09,57.09,57.09,47.98,43.42,15.85, 7.04, 8.46,6*0.0,
     * 5.44, 6.45, 7.16, 4.61, 4.61, 3.92, 2.33, 1.27, 0.75,6*0.0,
C..HDGV
     *18.26,11.09,11.09,11.09, 6.53, 3.25, 3.25, 1.62,7*0.0,
     *227.63,190.20,190.20,190.20,159.85,144.67,144.67, 15.82,7*0.0,
     * 8.88, 11.40,12.66, 9.45, 9.45, 8.03, 5.67, 6.25,7*0.0/
      DATA BC2/
C..LDDV
     * 1.31, 0.43, 0.51, 0.81, 0.71, 0.39, 0.39,8*0.0,
     * 2.71, 1.20, 1.39, 1.46, 1.52, 1.27, 1.27,8*0.0,
     * 1.46, 1.77, 1.33, 1.62, 1.46, 1.11, 0.75,8*0.0,
C..LDDT
     * 0.89, 0.37, 0.46,12*0.,
     * 1.38, 1.61, 1.37,12*0.,
     * 1.60, 1.82, 1.63, 1.03,11*0.,
C..HDDV
```

```
     * 3.49, 2.65,13*0.,
     *10.91,10.91,13*0.,
     *22.90,19.47,13.74,10.31,11*0.,
C..MC
     * 8.90, 3.40, 2.70, 2.50, 1.50,10*0.,
     *34.30,23.40,18.80,18.80,17.50,10*0.,
     * 0.20, 0.65, 0.76, 0.82, 0.80,10*0./
C
C..HIGH ALT. 49-STATE
      DATA BH1/
C..LDGV
     * 9.35, 5.60, 4.58, 4.58, 2.41, 1.07, 2.10, 0.46,
     * 0.59, 0.56, 0.56, 0.45,3*0.00,
     *117.70, 85.54, 79.64, 75.63, 50.46, 19.55, 39.39, 18.22,
     * 11.84, 9.96, 9.78, 7.18,3*0.00,
     * 1.96, 2.91, 1.91, 1.70, 1.42, 1.02, 1.02, 0.75,
     * 0.75, 0.75, 0.75, 0.00, 0.00, 0.00, 0.00,
C..LDGT1
     *9.35, 5.60, 4.58, 4.58, 3.44, 1.53, 3.00, 1.61, 1.47,
     *1.04, 1.04, 0.58, 0.48, 0.00, 0.00,
     *117.70,85.54,79.64,75.63,62.35,24.16,48.67,27.20,20.50,
     * 16.52,16.52, 6.14, 4.38, 0.00, 0.00,
     * 1.96, 2.91, 1.91, 2.07, 2.48, 1.78, 1.12, 1.91,
     * 1.90, 1.42, 0.59, 0.00, 0.00, 0.00, 0.00,
C..LDGT2
     * 12.35, 8.26, 8.26, 1.61, 1.47, 1.04, 1.04, 0.58, 0.48,6*0.0,
     *141.35,105.90,105.90,27.20,20.50,16.52,16.52, 6.14, 4.38,6*0.0,
     * 3.10, 4.32, 3.07, 1.12, 1.91, 1.90, 1.42, 0.59,7*0.0,
C..HDGV
     * 23.56, 15.12, 15.12, 6.64, 2.68, 1.36, 0.0 , 0.0 ,7*0.0 ,
     *342.36,352.82,352.82,268.36, 27.37, 11.28, 0.0 , 0.0 ,7*0.0 ,
     * 5.06, 7.64, 6.29, 6.29, 11.69, 1.88, 0.0 , 0.0 , 7*0.00/
      DATA BH2/
C..LDDV
     * 5.01, 0.99, 1.17, 1.84, 1.61, 0.80, 0.54, 0.39,7*0.00,
     * 4.74, 2.10, 2.43, 2.54, 2.66, 3.22, 3.22, 1.27,7*0.00,
     * 1.46, 1.77, 1.33, 1.62, 1.46, 1.49, 1.11, 0.75,7*0.00,
C..LDDT
     * 2.16, 1.96, 1.96, 0.61, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
     * 5.15, 3.61, 3.47, 1.98, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
     * 1.75, 1.77, 1.89, 0.71, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
C..HDDV
     * 8.03, 6.10, 0.00, 0.00, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
     * 19.09, 19.09, 0.00, 0.00, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
     * 22.90, 5.43, 0.00, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,7*0.0 ,
C..MC
     * 11.48, 4.20, 4.12, 0.00, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
     * 51.88, 35.07, 34.58, 0.00, 0.00, 0.0 , 0.0 , 0.0 ,7*0.0 ,
     * 0.11, 0.45, 0.27, 0.00, 0.00, 0.00, 0.00, 0.00,7*0.00/
C..DETERIORATION RATES
C..LOW ALT. 49-STATE
      DATA DH1/
C..LDGV
     * 0.18, 0.25, 0.27, 0.17, 0.23, 0.23, 0.19, 0.19,7*0.0,
     * 2.22, 2.28, 3.13, 4.44, 3.86, 3.86, 3.72, 3.76, 3.76,6*0.0,
     * 0.00, 0.00, 0.04, 0.04, 0.10, 0.10, 0.10,8*0.0,
C..LDGT1
     * 0.18, 0.25, 0.27, 0.17, 0.23, 0.23, 0.26, 0.26, 0.16, 0.11,5*0.0,
     * 2.25, 2.55, 3.13, 2.44, 2.86, 2.86, 2.43, 2.35, 1.35, 1.59,5*0.0,
     * 0.00, 0.00, 0.04, 0.04, 0.10, 0.10, 0.08, 0.09, 0.00,
     * 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
C..LDGT2
     * 0.18, 0.25, 0.17, 0.29, 0.26, 0.26, 0.14, 0.11,7*0.0,
     * 2.25, 2.55, 2.44, 2.86, 2.43, 2.35, 1.35, 1.59,7*0.0,
     * 0.00, 0.00, 0.04, 0.10, 0.10, 0.08, 0.09,8*0.0,
C..HDGV
     * 0.35, 0.47, 0.32, 0.14, 0.39, 0.31,9*0.0,
     * 5.46, 8.75, 8.37, 6.37, 3.48, 4.09,9*0.0,
     * 0.00, 0.00, 0.09, 0.09, 0.63, 0.29,9*0.00/
      DATA D42/
C..LDDV
     * 0.08, 0.05, 0.03, 0.07, 0.05, 0.03, 9*0.,
     * 0.13, 0.06, 0.08, 0.09, 0.08, 0.05, 9*0.,
     * 0.04, 0.03, 0.07, 0.05, 0.06, 0.06, 0.06, 0.05, 7*0.,
C..LDDT
     * 0.09, 0.08, 0.08, 0.06,11*0.,
     * 0.09, 0.10, 0.09, 0.09,11*0.,
     * 0.06, 0.06, 0.07, 0.05,11*0.,
C..HDDV
     * 0.04, 0.04,13*0.,
     * 0.10, 0.10,13*0.,
     * 0.12, 0.07,13*0.,
C..MC
     * 0.78, 1.65, 1.73,12*0.,
     * 2.47, 3.96, 2.02,12*0.,
     * 0.06, 0.00, 0.00,12*0./
C
C..CALIFORNIA
      DATA DC1/
C..LDGV
     * 0.18, 0.25, 0.25, 0.37, 0.17, 0.35, 0.21, 0.17, 0.16, 0.16,5*0.0,
     * 2.25, 2.55, 2.55, 3.13, 2.44, 2.78, 2.22, 2.14, 2.65, 2.65,5*0.0,
     * 0.00, 0.00, 0.04, 0.04, 0.06, 0.07, 0.14, 0.11, 0.08,6*0.0,
C..LDGT1
     * 0.18, 0.25, 0.25, 0.37, 0.17, 0.35,  0.35, 0.21, 0.21, 0.17,
     * 0.16,4*0.0,
     * 2.25, 2.55, 2.55, 3.13, 2.44, 2.78, 2.78, 2.22, 2.14, 2.65,5*0.0,
     * 0.00, 0.00, 0.04, 0.04, 0.06, 0.07, 0.14, 0.13,7*0.0,
C..LDGT2
     * 0.18, 0.25, 0.17, 0.17, 0.17, 0.17, 0.35, 0.17, 0.16,6*0.0,
     * 2.25, 2.55, 2.44, 2.44, 2.44, 2.44, 2.78, 2.14, 2.65,6*0.0,
     * 0.00, 0.00, 0.00, 0.04, 0.04, 0.04, 0.08, 0.14, 0.16,6*0.0,
C..HDGV
     * 0.35, 0.47, 0.32, 0.32, 0.32, 0.14, 0.14, 0.39,7*0.0,
     * 5.46, 8.75, 8.37, 8.37, 8.37, 6.37, 6.37, 3.48,7*0.0,
     * 0.00, 0.00, 0.00, 0.09, 0.09, 0.09, 0.09, 0.09,7*0.0/
      DATA DC2/
C..LDDV
     * 0.08, 0.05, 0.03, 0.07, 0.05, 0.03, 0.03,8*0.0,
     * 0.13, 0.06, 0.08, 0.09, 0.08, 0.05, 0.05,8*0.0,
     * 0.04, 0.03, 0.07, 0.05, 0.06, 0.06, 0.05,8*0.0,
C..LDDT
     * 0.08, 0.06, 0.03,12*0.,
     * 0.09, 0.07, 0.05,12*0.,
     * 0.06, 0.06, 0.06, 0.06,11*0.,
C..HDDV
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```
     * 0.04, 0.04,3*0.,
     * 0.10, 0.10,3*0.,
     * 0.12, 0.12,0.12, 0.12,11*0.,
C..MC
     * 0.78, 1.55,1.64, 1.64, 1.64,10*0.,
     * 2.47, 3.23,1.62, 1.45, 1.45,10*0.,
     * 0.06, 0.00,0.00, 0.00, 0.00,10*0./
C
C..HIGH ALT. 49-STATE
      DATA DH1/
C..LDGV
     * 0.18, 0.25,0.37, 0.17, 0.29, 0.29, 0.29, 0.29, 0.24,
     * 0.24, 0.24,0.24,3*0.00,
     * 2.25, 2.55,3.13, 2.44, 2.06, 2.06, 2.06, 2.06, 4.14,
     * 4.17, 4.17,4.22,3*0.00,
     * 0.0 , 0.0 ,0.04, 0.04, 0.10, 0.10, 0.10, 0.15, 0.15,
     * 0.15, 0.15,*0.00,
C..LDGT1
     * 0.18, 0.25,0.37, 0.17, 0.29, 0.29, 0.29, 0.29, 0.26,
     * 0.26, 0.26,0.16, 0.14,2*0.0,
     * 2.25, 2.25,3.13, 2.44, 2.06, 2.06, 2.06, 2.06, 2.43,
     * 2.35, 2.35,1.35, 2.45,2*0.0,
     * 0.0 , 0.0 ,0.04, 0.04, 0.04, 0.04, 0.10, 0.10, 0.10,
     * 0.08, 0.09,*0.0,
C..LDGT2
     * 0.18, 0.25,0.17, 0.29, 0.26, 0.26, 0.26, 0.16, 0.14,6*0.0 ,
     * 2.25, 2.55,2.44, 2.06, 2.43, 2.35, 2.35, 1.35, 2.45,6*0.0 ,
     * 0.0 , 0.0 ,0.04, 0.10, 0.10, 0.10, 0.08, 0.09,7*0.0 ,
C..HDGV
     * 0.35, 0.47,0.32, 0.14, 0.33, 0.40, 0.0 , 0.0 , 0.0 ,6*0.0 ,
     * 5.46, 8.75,8.37, 6.37,03.48,06.31, 0.0 , 0.0 , 0.0 ,6*0.0 ,
     * 0.0 , 0.0 ,0.09, 0.09, 0.63, 0.29, 0.0 , 0.0 , 0.0 ,6*0.00/
       DATA DH2/
C..LDGV
     * 0.08, 0.09,0.03, 0.07, 0.05, 0.03, 0.03, 0.03, 0.00,6*0.00,
     * 0.15, 0.06,0.08, 0.09, 0.08, 0.05, 0.05, 0.05, 0.00,6*0.00,
     * 0.04, 0.03,0.07, 0.05, 0.06, 0.06, 0.06, 0.05, 0.00,6*0.00,
C..LDGT
     * 0.05, 0.08,0.08, 0.06, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 ,
     * 0.09, 0.10,0.09, 0.09, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 ,
     * 0.06, 0.06,0.07, 0.05, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 ,
C..HDGV
     * 0.04, 0.04,0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 ,
     * 0.10, 0.10,0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 ,
     * 0.12, 0.02,0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 ,
C..MC
     * 0.78, 1.60,1.73, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,6*0.00,
     * 2.47, 3.38,2.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,6*0.00,
     * 0.06, 0.0 ,0.0 , 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,6*0.00/
C
       END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 5
C
      COMMON/IDLBCM/IDLB49,IDLBCA,IDLBHI
      COMMON/IDLDCM/IDEL49,IDELCA,IDELHI
C
C..IDLBCM ( IG, IP, IV, IR )
C..IDLDCM ( IG, IP, IV, IR )
C
      REAL IDLB49(15,3,8),IDLBCA(15,3,8),IDLBHI(15,3,8)
      REAL IB41(15,3,4),IB42(15,3,4)
      EQUIVALENCE(IDLB49(1,1,1),IB41(1,1,1)),(IDLB49(1,1,5),IB42(1,1,1))
      REAL IBC1(15,3,4),IBC2(15,3,4)
      EQUIVALENCE(IDLBCA(1,1,1),IBC1(1,1,1)),(IDLBCA(1,1,5),IBC2(1,1,1))
      REAL IBH1(15,3,4),IBH2(15,3,4)
      EQUIVALENCE(IDLBHI(1,1,1),IBH1(1,1,1)),(IDLBHI(1,1,5),IBH2(1,1,1))
      REAL IDEL49(15,3,8),IDELCA(15,3,8),IDELHI(15,3,8)
      REAL IL41(15,3,4),IL42(15,3,4)
      EQUIVALENCE(IDEL49(1,1,1),IL41(1,1,1)),(IDEL49(1,1,5),IL42(1,1,1))
      REAL ILC1(15,3,4),ILC2(15,3,4)
      EQUIVALENCE(IDELCA(1,1,1),ILC1(1,1,1)),(IDELCA(1,1,5),ILC2(1,1,1))
      REAL ILH1(15,3,4),ILH2(15,3,4)
      EQUIVALENCE(IDELHI(1,1,1),ILH1(1,1,1)),(IDELHI(1,1,5),ILH2(1,1,1))
C
C..IDLE EXHAUST EMISSION ZERO MILEAGE EMISSION & DETERIORATION
C..(PER 10K MILES) RATES.   1 LINE PER POL. FOR EACH VEH.TYPE
C
C..ZERO MILE (BASE) RATES
C..LOW ALT. 49-STATE
      DATA IB41/
C..LDGV
     * 1.32, 1.47, 0.26, 0.73, 0.34, 0.07, 0.05, 0.05,7*0.0,
     *13.76,13.20,11.84,13.44, 6.40, 1.82, 1.42, 1.20, 1.18,6*0.0,
     * 0.05 ,0.17, 0.14, 0.20, 0.18, 0.17, 0.18,8*0.0,
C..LDGT1
     * 1.32, 1.47, 0.26, 0.73, 0.37, 0.07, 0.08, 0.08, 0.04, 0.03,5*0.0,
     *13.76,13.20,11.84,12.88, 6.47, 1.27, 1.21, 1.12, 0.63, 0.14,5*0.0,
     * 0.05, 0.17, 0.14, 0.06, 0.08, 0.08, 0.08, 0.03,7*0.0,
C..LDGT2
     * 1.47, 1.08, 1.08, 0.07, 0.08, 0.08, 0.04, 0.03,7*0.0,
     *10.58,11.23,11.23, 1.27, 1.21, 1.12, 0.43, 0.14,7*0.0,
     * 0.08, 0.10, 0.07, 0.08, 0.08, 0.03, 0.03,8*0.0,
C..HDGV
     * 2.20, 0.82, 0.82, 0.43, 0.14, 0.10,9*0.0,
     *22.18, 0.12, 0.12, 0.47, 0.74, 0.34,9*0.0,
     * 0.04, 0.02, 0.08, 0.08, 0.07, 0.01,9*0.0/
      DATA IB42/
C..LDDV
     * 0.14, 0.03, 0.04, 0.08, 0.02, 0.01,9*0.0,
     * 0.23, 0.14, 0.18, 0.11, 0.18, 0.12,9*0.0,
     * 0.13, 0.20, 0.17, 0.20, 0.18, 0.18, 0.16, 0.08,7*0.0,
C..LDDT
     * 0.08, 0.10, 0.10, 0.07,11*0.0,
     * 0.30, 0.30, 0.31, 0.31,11*0.0,
     * 0.13, 0.30, 0.30, 0.13,11*0.0,
C..HDDV
     * 0.38, 0.27,13*0.0,
27058           * 0.67, 0.67,12*0.,
27059           * 0.52, 0.22,12*0.,
27060      C..MC
27061           * 1.95, 0.74, 0.59,12*0.0,
27062           * 4.33, 2.92, 2.34,12*0.0,
27063           * 0.01, 0.02, 0.04,12*0.0/
27064      C
27065      C..CALIFORNIA
27066            DATA IBC1/
27067      C..LDGV
27068           * 1.89, 0.97, 0.70, 0.60, 0.53, 0.06, 0.03, 0.04, 0.05, 0.05,5*0.0,
27069           *10.05,10.41,12.83,10.40, 7.05, 0.51, 0.28, 0.43, 0.44, 0.44,5*0.0,
27070           * 0.05, 0.05, 0.07, 0.07, 0.09, 0.07, 0.04, 0.02, 0.02,6*0.0,
27071      C..LDGT1
27072           * 1.89, 0.93, 0.70, 0.60, 0.53, 0.51, 0.06, 0.04, 0.04, 0.05,
27073           * 0.06,4*0.0,
27074           *10.05,10.41,12.83,10.40, 7.05, 3.86, 3.16, 0.88, 1.49, 1.79,5*0.0,
27075           * 0.05, 0.05, 0.07, 0.07, 0.09, 0.08, 0.05, 0.03,7*0.0,
27076      C..LDGT2
27077           * 1.67, 1.06, 1.06, 1.06, 0.64, 0.56, 0.06, 0.06, 0.06,6*0.0,
27078           *10.98,11.53,11.53,11.53, 9.69, 8.77, 3.16, 1.49, 1.79,6*0.0,
27079           * 0.08, 0.10, 0.11, 0.07, 0.07, 0.06, 0.04, 0.02, 0.01,6*0.0,
27080      C..HDGV
27081           * 2.39, 0.82, 0.82, 0.82, 0.53, 0.35, 0.35, 0.14,7*0.0,
27082           *22.18, 6.12, 6.12, 6.12, 3.17, 6.46, 6.46, 0.70,7*0.0,
27083           * 0.04, 0.05, 0.06, 0.06, 0.06, 0.05, 0.04, 0.03,7*0.0/
27084            DATA IBC2/
27085      C..LDDV
27086           * 0.14, 0.03, 0.04, 0.06, 0.05, 0.03, 0.03,8*0.0,
27087           * 0.53, 0.14, 0.18, 0.17, 0.18, 0.12, 0.12,8*0.0,
27088           * 0.13, 0.23, 0.17, 0.20, 0.18, 0.14, 0.03,8*0.0,
27089      C..LDDT
27090           * 0.08, 0.06, 0.06,12*0.0,
27091           * 0.31, 0.53, 0.12,12*0.0,
27092           * 0.36, 0.32, 0.18, 0.13,11*0.0,
27093      C..HDDV
27094           * 0.38, 0.37,13*0.0,
27095           * 0.67, 0.67,13*0.0,
27096           * 0.32, 0.28, 0.22, 0.41,11*0.0,
27097      C..MC
27098           * 1.38, 0.74, 0.59, 0.59, 0.59,10*0.0,
27099           * 4.33, 2.92, 2.37, 2.37, 2.37,10*0.0,
27100           * 0.01, 0.03, 0.04, 0.04, 0.04,10*0.0/
27101      C
27102      C..HIGH ALT. 49 STATE
27103            DATA IBHI1/
27104      C..LDGV
27105           &  1.03,  0.76,  0.71,  0.76,  0.27,  0.13, 0.24, 0.05, 0.07,
27106           &  0.06,  0.06,  0.02,  0.00,  0.00,  0.00,
27107           C 10.38, 11.24, 10.83, 10.88,  7.65,  4.81, 2.78, 2.08, 1.76,
27108           C  1.06,  1.06,  1.08,  0.00,  0.00,  0.00,
27109           &  0.11,  0.08,  0.07,  0.07,  0.08,  0.06, 0.06, 0.03, 0.03,
27110           &  0.03,  0.03,  0.00,  0.00,  0.00,  0.00,
27111      C..LDGT1
27112           &  1.03,  0.78,  0.71,  0.76,  0.33,  0.13, 0.38, 0.06, 0.16,
27113           &  0.07,  0.07,  0.06,  0.06,  0.00,  0.00,
27114           C 10.38, 11.24, 10.83, 10.88,  7.76,  3.06, 0.06, 11.22, 3.27,
27115           C  1.72,  1.72,  0.08,  0.08,  0.00,  0.00,
```

[illegible]

```
     * 0.01, 0.01,13*0.,
     * 0.00, 0.00,13*0.,
C..MC
     * 0.42, 0.36, 0.38,12*0.0,
     * 0.23, 0.50, 0.26,12*0.0,
     * 0.00, 0.00, 0.00,12*0.0/
C
C..CALIFORNIA
      DATA ILC1/
C..LDGV
     * 0.04, 0.05, 0.04, 0.06, 0.03, 0.04, 0.02, 0.02, 0.02, 0.02,5*0.0,
     * 0.51, 0.47, 0.61, 0.70, 0.52, 0.17, 0.13, 0.13, 0.16, 0.16,5*0.0,
     * 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.01, 0.00, 0.00,6*0.0,
C..LDGT1
     * 0.04, 0.05, 0.04, 0.06, 0.03, 0.06, 0.04, 0.02, 0.02, 0.02,
     * 0.02,4*0.0,
     * 0.51, 0.47, 0.61, 0.70, 0.52, 0.59, 0.59, 0.47, 0.45, 0.56,5*0.0,
     * 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.01, 0.01,7*0.0,
C..LDGT2
     * 0.03, 0.04, 0.03, 0.03, 0.03, 0.03, 0.04, 0.02, 0.02,6*0.0,
     * 0.45, 0.52, 0.49, 0.49, 0.49, 0.49, 0.59, 0.45, 0.56,6*0.0,
     * 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,6*0.0,
C..HDGV
     * 0.04, 0.04, 0.02, 0.02, 0.02, 0.01, 0.01, 0.03,7*0.0,
     * 0.53, 0.28, 0.27, 0.27, 0.27, 0.28, 0.28, 0.14,7*0.0,
     * 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,7*0.0/
      DATA ILC2/
C..LDDV
     * 0.01, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,8*0.0,
     * 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01,8*0.0,
     * 0.00, 0.00, 0.01, 0.01, 0.01, 0.01, 0.01,8*0.0,
C..LDDT
     * 0.01, 0.00, 0.00,12*0.,
     * 0.01, 0.01, 0.01,12*0.,
     * 0.01, 0.01, 0.01, 0.01,11*0.,
C..HDDV
     * 0.00, 0.00,13*0.,
     * 0.01, 0.01,13*0.,
     * 0.00, 0.00, 0.00, 0.00,11*0.,
C..MC
     * 0.42, 0.34, 0.36, 0.36, 0.36,10*0.,
     * 0.23, 0.41, 0.20, 0.18, 0.18,10*0.,
     * 0.00, 0.00, 0.00, 0.00, 0.00,10*0./
C
C..HIGH ALT. 49-STATE
      DATA ILH1/
C..LDGV
     H 0.03, 0.06, 0.07, 0.04, 0.07, 0.03, 0.03, 0.03, 0.03,
     H 0.03, 0.03, 0.03, 0.00, 0.00, 0.00,
     C 0.40, 0.63, 0.88, 0.76, 0.85, 0.42, 0.42, 0.42, 0.61,
     C 0.61, 0.61, 0.62, 0.00, 0.00, 0.00,
     N 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.01, 0.01,
     N 0.01, 0.01, 0.00, 0.00, 0.00, 0.00,
C..LDGT1
     H 0.03, 0.06, 0.07, 0.04, 0.06, 0.06, 0.06, 0.02, 0.02,
     H 0.02, 0.02, 0.01, 0.01, 0.00, 0.00,
     C 0.40, 0.63, 0.88, 0.76, 0.72, 0.72, 0.72, 0.32, 0.27,
     C 0.24, 0.24, 0.14, 0.28, 0.00, 0.00,
     N 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
     N 0.00, 0.00, 0.00, 0.00, 0.00, 0.00,
C..LDGT2
     H 0.03, 0.04, 0.03, 0.02, 0.02, 0.02, 0.02, 0.01, 0.01,6*0.0,
     C 0.45, 0.52, 0.49, 0.32, 0.27, 0.24, 0.24, 0.14, 0.28,6*0.0,
     N 0.0 , 0.0 , 0.00, 0.00, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
C..HDGV
     H 0.04, 0.04, 0.02, 0.01, 0.03, 0.04, 0.0 , 0.0 , 0.0 ,6*0.0,
     C 0.53, 0.28, 0.27, 0.28, 0.14, 0.28, 0.0 , 0.0 , 0.0 ,6*0.0,
     N 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0/
      DATA ILH2/
C..LDDV
     H 0.01, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.00, 0.0 ,6*0.0,
     C 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.0 ,6*0.0,
     N 0.0 , 0.0 , 0.01, 0.01, 0.01, 0.01, 0.01, 0.01, 0.00,6*0.0,
C..LDDT
     H 0.01, 0.01, 0.01, 0.01, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
     C 0.02, 0.02, 0.01, 0.01, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
     N 0.01, 0.01, 0.01, 0.01, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
C..HDDV
     H 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
     C 0.01, 0.01, 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
     N 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
C..MC
     H 0.42, 0.36, 0.38, 0.00, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
     C 0.23, 0.50, 0.26, 0.00, 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0,
     N 0.0 , 0.0 , 0.0 , 0.0 , 0.00, 0.0 , 0.0 , 0.0 , 0.0 ,6*0.0 /
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 6
C
      COMMON/IMCRED/IRED(19,20,5,2,2),ITECH4(19,20,5)
C
C
      INTEGER
     *R1(19,20),R2(19,20),R3(19,20),R4(19,20),
     *R5(19,20),R6(19,20),R7(19,20),R8(19,20),
     *R9(19,20),R10(19,20),R11(19,20),R12(19,20),
     *R13(19,20),R14(19,20),R15(19,20),R16(19,20),
     *R17(19,20),R18(19,20),R19(19,20),R20(19,20),
     *T1(19,20),T2(19,20),T3(19,20),T4(19,20),
     *T5(19,20)
C
      EQUIVALENCE
     *(IRED(1,1,1,1,1),R1(1,1)),(IRED(1,1,2,1,1),R2(1,1)),
     *(IRED(1,1,3,1,1),R3(1,1)),(IRED(1,1,4,1,1),R4(1,1)),
     *(IRED(1,1,5,1,1),R5(1,1)),(IRED(1,1,1,2,1),R6(1,1)),
     *(IRED(1,1,2,2,1),R7(1,1)),(IRED(1,1,3,2,1),R8(1,1)),
     *(IRED(1,1,4,2,1),R9(1,1)),(IRED(1,1,5,2,1),R10(1,1)),
     *(IRED(1,1,1,1,2),R11(1,1)),(IRED(1,1,2,1,2),R12(1,1)),
     *(IRED(1,1,3,1,2),R13(1,1)),(IRED(1,1,4,1,2),R14(1,1)),
     *(IRED(1,1,5,1,2),R15(1,1)),(IRED(1,1,1,2,2),R16(1,1)),
     *(IRED(1,1,2,2,2),R17(1,1)),(IRED(1,1,3,2,2),R18(1,1)),
     *(IRED(1,1,4,2,2),R19(1,1)),(IRED(1,1,5,2,2),R20(1,1)),
     *(ITECH4(1,1,1),T1(1,1)),(ITECH4(1,1,2),T2(1,1)),
     *(ITECH4(1,1,3),T3(1,1)),(ITECH4(1,1,4),T4(1,1)),
     *(ITECH4(1,1,5),T5(1,1))
C
C       INSPECTION/MAINTENANCE PERCENT REDUCTIONS:
      DATA R1/ 3,14,19,22,25,27,29,31,33,35,37,39,41,43,44,46,47,49,51,
     *        13,18,22,24,26,29,31,33,35,37,39,41,42,44,46,47,49,50,17,
     *        13,19,23,25,27,29,32,34,36,38,39,41,43,45,47,48,50,34,17,
     *        13,20,24,26,28,30,33,35,37,39,40,42,44,46,47,49,41,33,17,
     *        14,20,25,27,30,32,34,36,37,39,41,43,45,46,48,43,39,32,17,
     *        14,21,26,29,31,33,35,37,38,40,42,44,46,47,43,41,38,31,16,
     *        14,22,27,30,32,34,36,38,39,41,43,45,46,44,42,40,37,30,16,
     *        14,23,28,31,33,35,37,39,40,42,44,45,44,42,40,38,36,30,16,
     *        14,24,30,33,35,36,38,40,42,43,45,45,43,41,39,37,34,29,16,
     *        15,25,31,34,36,38,39,41,43,44,45,43,41,40,38,36,33,28,16,
     *        15,26,32,35,37,39,41,42,44,45,44,42,40,38,36,34,32,26,16,
     *        15,27,33,36,38,40,42,43,46,44,42,41,39,37,35,33,30,25,15,
     *        15,28,35,38,39,41,43,47,45,43,41,39,37,36,34,32,29,24,15,
     *        15,28,36,39,41,42,48,46,44,42,40,38,36,34,33,31,28,23,15,
     *        15,29,37,40,42,49,47,45,43,41,39,37,35,33,31,29,26,22,15,
     *        16,30,38,41,50,48,46,44,42,40,38,36,34,32,30,28,25,21,14,
     *        16,31,39,51,49,47,45,43,42,40,38,36,33,31,29,27,24,20,14,
     *        16,31,52,50,48,47,45,43,41,39,37,35,33,30,28,26,23,19,14,
     *        16,53,51,50,48,46,44,42,40,38,36,34,32,29,27,24,22,19,13,
     *        53,52,50,48,46,45,43,41,39,37,34,32,30,27,25,22,19,15, 3/
      DATA R2/ 4,17,23,27,30,32,34,36,37,39,41,42,44,45,47,49,50,52,53,
     *        15,22,27,29,32,34,36,37,39,40,42,44,45,47,48,50,52,53,24,
     *        15,24,28,31,33,35,37,39,40,41,43,45,46,48,50,51,53,44,24,
     *        16,25,30,32,34,36,38,40,41,43,44,46,48,49,51,52,50,43,23,
     *        17,26,32,34,36,38,39,41,43,44,46,47,49,51,52,50,49,42,23,
     *        17,28,33,35,37,39,40,42,44,46,47,49,50,52,50,49,47,41,23,
*        18,29,35,37,38,40,42,43,45,47,48,50,51.50,49,48,46,39,22,
*        18,30,36,38,39.41,43,44,46,47,49,51,50,48,47,46,45,38,22,
*        19,31,37,39,41,42,44,45,47,49,50,51,49,47,46,45,43,37,22,
*        19,32,38,41,42,43,45,47,48,50,51,50,48,46,44,44,42,36,21,
*        19,32,39,42,43,44,46,48,49,52,50,49,47,45,43,42,41,35,21,
*        20,33,41,43,44,46,47,49,53,51,49,47,45,44,42,41,39,34,20,
*        20,34,42,45,46,47,48,53,52,50,48,46,44,43.41,40,38,33,19,
*        20,35,43,46,47,48,54,52,51,49,47,46,44,42,40,39,36,31,19,
*        20,36,44,47,48,55,53,52,50,48,46,45,43,41,39.37,35,29,18,
*        21,36,45,48,55,54,52,51,49,47,45,43,42,40,37,35,33,28,17,
*        21,37,46,56,54,53,51,49,47,46,44,42,40,38,36,33,31,26,17,
*        21,38,57,55,53,52,50,48,46,45,43,41,39,37,34,32,29,24,16,
*        21,57,56,54,52,50,49,47,45,43,42,40,38,35,33,30,27,23,15,
*        58,56,54,52,51,49,47,45,44,42,40,38,35,33,30,28,24,17, 4/
 DATA R3/ 4,19,27,30,32,34,35,37,38,39,41,42,44,46,47,49,51,52,54,
*        16,26,30,32,34,35,37,38,39,41,43,44,46,47,49,51,52,54,30,
*        17,27,31,33,35,36,38,39,41,42,44,46,47,49,51,52,54,49,30,
*        18,28,32,34,36,37,39,40,42,44,46,47,49,50,52,54,53,48,29,
*        19,29,34,36,37,39,40,42,44,45,47,49,50,52,53,54,52,47,28,
*        20,30,35,37,39,40,42,43,45,47,48,50,52,53,53,52,51,45,28,
*        20,31,36,39,40,41,43,45,46,48,50,51,53,53,52,51,49,44,27,
*        21,32,38,40,41,43,45,46,48,49,51,52,54,52,51,50,48,43,27,
*        22,33,39,41,43,44,46,48,49,51,52,54,52,51,49,48,47,42,26,
*        22,34,40,43,44,46,47,49,50,52,55,53,52,50,48,47,45,40,25,
*        23,35,42,44,46,47,49,50,52,55,54,52,50,49,47,45,44,39,25,
*        23,36,43,45,47,48,50,51,56,54,53,51,49,47,46,44,42,37,24,
*        24,37,44,47,48,50,51,56,55,53,51,49,48,46,44,42,41,36,23,
*        24,38,45,48,50,51,57,55,53,52,50,48,46,45,43,41,39,34,22,
*        24,39,46,50,51,57,56,54,52,50,48,47,45,43,41,40,37,32,21,
*        25,39,48,51,58,56,54,52,51,49,47,45,44,42,40,38,35,31,20,
*        25,40,49,58,56,55,53,51,49,48,46,44,42,40,38,36,33,29,19,
*        25,41,58,57,55,53,51,50,48,46,45,43,41,39,37,34,31,27,18,
*        26,58,57,55,54,52,50,49,47,45,43,41,39,37,35,33,30,26,17,
*        59,57,55,54,52,50,49,47,45,44,42,40,37,35,33,30,27,19, 4/
 DATA R4/ 5,21,29,32,33,34,35,36,37,38,40,41,43,45,46,48,50,51,53,
*        18,28,31,33,34,35,36,37,38,40,41,43,45,46,48,50,52,53,36,
*        19,29,32,34,36,36,37,39,40,41,43,45,47,49,50,52,54,52,35,
*        20,30,33,35,37,38,39,40,42,44,46,47,49,51,52,54,56,51,35,
*        21,31,35,36,38,39,41,42,44,46,47,49,51,52,54,56,54,50,34,
*        22,32,36,38,39,41,42,44,46,47,49,51,52,54,56,55,53,49,33,
*        23,32,37,39,40,42,44,46,47,49,51,52,54,56,55,53,51,47,33,
*        23,33,38,40,42,44,46,47,49,51,52,54,56,55,53,52,50,46,32,
*        24,34,40,42,44,45,47,49,50,52,53,57,55,53,52,50,48,45,31,
*        25,35,41,43,45,47,48,50,52,53,57,56,54,52,50,49,47,43,30,
*        25,36,42,45,47,48,50,52,53,57,56,54,52,50,49,47,46,42,29,
*        26,37,44,46,48,50,51,53,58,56,54,53,51,49,47,46,44,40,28,
*        26,38,45,48,50,51,53,58,56,55,53,51,49,48,46,44,42,38,26,
*        26,39,46,49,51,52,58,57,55,53,51,50,48,46,44,43,41,36,25,
*        27,40,48,51,52,58,57,55,53,52,50,48,47,45,43,41,39,34,23,
*        27,41,49,52,59,57,55,54,52,50,49,47,45,43,41,39,37,32,22,
*        27,42,50,59,57,56,54,52,51,49,47,46,44,42,40,37,35,30,21,
*        28,42,59,58,56,54,53,51,49,48,46,44,42,40,38,35,33,29,20,
*        28,59,58,56,54,53,51,49,48,46,44,42,40,38,36,33,32,28,19,
*        59,58,56,54,53,51,49,48,46,44,42,40,38,36,34,32,29,21, 5/
 DATA R5/ 6,23,31,33,34,34,34,35,35,36,37,39,40,42,44,45,47,49,51,
*        21,30,33,34,34,34,35,35,36,37,39,40,42,44,46,47,49,51,41,
*        21,30,33,34,35,35,36,37,38,39,41,43,44,46,48,50,52,55,40,
*        22,31,34,35,35,36,37,38,40,42,43,45,47,49,51,52,57,54,40,
     *          23,31,34,36,37,38,39,40,42,44,46,48,49,51,53,58,56,52,39,
     *          24,32,35,37,38,39,41,43,45,46,48,50,52,53,58,56,55,51,38,
     *          24,32,36,38,40,41,43,45,47,49,50,52,53,58,57,55,53,49,37,
     *          25,33,37,40,42,43,45,47,49,51,52,54,58,57,55,53,51,48,36,
     *          25,34,39,42,44,45,47,49,51,52,54,58,57,55,53,52,50,46,35,
     *          26,34,40,43,45,47,49,50,52,54,59,57,55,54,52,50,48,45,33,
     *          26,35,42,45,47,49,51,52,54,59,57,56,54,52,50,49,47,43,32,
     *          27,36,43,47,49,51,52,53,59,57,56,54,52,51,49,47,45,42,31,
     *          27,37,44,48,50,52,53,59,58,56,54,52,51,49,48,46,44,40,29,
     *          28,38,46,49,52,53,59,58,56,54,53,51,49,48,46,44,42,38,27,
     *          28,39,47,51,53,59,58,56,54,53,51,49,48,46,44,42,40,35,25,
     *          28,40,49,52,59,58,56,55,53,51,50,48,46,44,42,40,38,33,23,
     *          29,41,50,59,58,56,55,53,51,50,48,46,44,42,40,38,35,31,22,
     *          29,42,59,58,56,55,53,51,50,48,46,44,42,40,38,36,33,30,21,
     *          29,59,58,56,55,53,51,50,48,46,45,43,40,38,36,34,33,30,21,
     *          59,58,56,55,53,51,50,48,46,45,43,40,38,36,34,33,31,23, 6/
      DATA R6/ 3,17,26,31,33,35,37,38,39,40,42,43,44,45,47,48,49,51,52,
     *          14,24,29,32,34,36,37,39,40,41,42,44,45,46,47,49,50,51,13,
     *          13,22,27,31,33,35,36,37,39,40,41,42,44,45,46,47,49,19,13,
     *          13,21,26,29,32,34,35,36,38,39,40,42,43,44,45,47,23,19,13,
     *          12,20,25,28,31,33,34,36,37,38,40,41,42,44,45,26,23,19,13,
     *          12,20,24,28,30,32,34,35,37,38,40,41,42,43,29,26,23,19,13,
     *          12,19,24,27,30,31,33,35,36,38,39,40,42,31,29,26,23,19,13,
     *          12,19,23,27,29,31,33,35,36,37,39,40,33,31,29,27,24,19,13,
     *          12,19,23,27,29,31,33,35,36,37,39,35,33,31,29,27,24,19,13,
     *          12,18,23,26,29,31,33,34,36,37,36,35,33,32,30,27,24,20,13,
     *          12,18,23,26,29,31,33,35,36,38,37,35,34,32,30,28,24,20,13,
     *          12,18,23,26,29,31,33,35,40,38,37,35,34,32,30,28,24,20,13,
     *          12,18,23,26,29,31,33,41,40,38,37,35,34,32,30,28,25,20,13,
     *          12,18,23,26,29,31,42,41,40,38,37,36,34,33,31,28,25,21,14,
     *          12,18,23,26,29,44,43,41,40,39,38,36,35,33,31,29,26,21,14,
     *          12,18,23,26,46,45,43,42,41,40,38,37,35,34,32,30,26,22,14,
     *          12,18,23,48,47,45,44,43,42,40,39,38,36,35,33,31,27,23,14,
     *          12,18,50,49,47,46,45,44,42,41,40,39,37,36,35,32,29,24,15,
     *          12,52,51,50,49,48,46,45,44,43,41,40,39,38,36,34,31,26,15,
     *          53,52,51,50,48,47,46,44,43,42,41,40,38,37,35,33,28,19, 3/
      DATA R7/ 4,22,30,34,37,38,40,41,43,44,45,46,48,49,50,51,53,54,55,
     *          18,29,34,36,38,39,41,42,43,45,46,47,49,50,51,52,53,55,22,
     *          18,28,33,36,38,39,41,42,43,45,46,47,48,50,51,52,53,29,22,
     *          18,28,33,36,38,39,41,42,43,45,46,47,48,50,51,52,34,29,22,
     *          18,28,32,35,38,39,41,42,43,44,46,47,48,49,51,37,33,29,22,
     *          19,27,32,35,37,39,40,42,43,44,46,47,48,49,39,36,33,29,21,
     *          19,27,32,35,37,39,40,42,43,44,45,47,48,41,39,36,33,29,21,
     *          19,27,31,34,37,39,40,42,43,44,46,47,42,40,38,36,33,28,21,
     *          19,27,31,34,37,39,40,42,43,45,46,44,42,40,38,36,33,28,21,
     *          19,27,31,35,37,39,40,42,43,45,45,43,42,40,38,36,33,28,21,
     *          19,27,32,35,37,39,41,42,44,46,44,43,42,40,38,36,32,28,21,
     *          19,27,32,35,37,39,41,43,47,46,44,43,41,40,38,35,33,28,21,
     *          19,27,32,35,38,40,42,48,47,46,44,43,41,40,38,36,33,28,21,
     *          19,27,32,35,38,40,49,48,47,46,44,43,41,40,38,36,33,28,21,
     *          20,27,32,36,38,50,49,48,47,45,44,43,41,40,38,36,33,29,21,
     *          20,27,32,36,52,51,49,48,47,46,44,43,42,40,39,37,34,29,21,
     *          20,28,33,54,53,52,50,49,48,46,45,44,42,41,39,37,35,30,21,
     *          20,28,56,54,53,52,50,49,48,47,45,44,43,41,40,38,36,31,21,
     *          20,57,56,55,53,52,50,49,48,47,46,44,43,42,41,39,37,32,21,
     *          57,56,55,54,52,51,50,48,47,46,45,43,42,41,40,38,34,25, 5/
      DATA R8/ 5,25,33,37,39,41,42,43,45,46,47,48,49,50,51,52,54,55,56,
     *          22,32,36,39,40,42,43,45,46,47,48,49,50,51,52,54,55,56,29,
     *       22,32,37,39,41,43,44,45,47,48,49,50,51,52,53,55,56,39,29,
     *       23,33,37,40,41,43,44,46,47,48,49,51,52,53,54,55,43,38,28,
     *       24,33,37,40,42,43,45,46,47,48,50,51,52,53,55,46,42,38,28,
     *       24,33,38,40,42,44,45,46,48,49,50,51,53,54,48,45,42,38,28,
     *       24,33,38,41,43,44,46,47,48,50,51,52,53,49,47,45,42,37,28,
     *       25,34,38,41,43,45,46,48,49,50,51,53,50,48,46,44,42,37,28,
     *       25,34,39,42,44,45,47,48,49,51,52,51,49,48,46,44,41,37,27,
     *       25,34,39,42,44,46,47,49,50,52,51,50,49,47,46,44,41,37,27,
     *       25,35,40,43,45,46,48,49,50,53,51,50,49,47,46,44,41,36,27,
     *       26,35,40,43,45,47,48,50,54,53,51,50,49,47,46,43,41,36,27,
     *       26,35,40,43,46,47,49,55,54,52,51,50,48,47,45,43,40,36,26,
     *       26,36,41,44,46,48,56,54,53,52,50,49,48,46,45,43,40,35,26,
     *       26,36,41,44,47,57,55,54,52,51,50,48,47,46,44,42,40,35,26,
     *       27,36,41,45,57,56,54,53,52,51,49,48,47,45,44,42,39,35,26,
     *       27,37,42,58,57,55,54,53,52,50,49,48,46,45,43,42,39,35,25,
     *       27,37,59,58,56,55,54,53,51,50,49,47,46,45,43,42,39,35,25,
     *       27,59,57,56,55,54,52,51,50,49,48,47,45,44,43,42,39,35,25,
     *       58,57,56,55,53,52,51,50,49,48,47,46,44,43,42,40,37,28, 6/
      DATA R9/ 6,27,35,38,40,41,42,43,44,45,46,47,49,50,51,52,53,55,55,
     *       24,34,38,40,41,43,44,45,46,47,48,49,50,51,52,53,54,55,34,
     *       25,35,39,41,43,44,45,46,47,48,49,50,51,52,53,54,55,46,34,
     *       26,36,40,42,44,45,46,47,48,49,50,51,52,53,54,56,51,45,34,
     *       27,37,41,43,45,46,47,48,49,50,51,52,53,55,56,53,50,45,33,
     *       28,37,42,44,45,47,48,49,50,51,52,54,55,56,55,53,49,44,33,
     *       28,38,42,45,46,48,49,50,51,52,54,55,56,56,54,52,49,44,33,
     *       29,39,43,45,47,49,50,51,52,53,55,56,56,55,53,51,48,43,32,
     *       29,39,44,46,48,49,51,52,53,54,56,57,55,54,52,50,48,43,32,
     *       30,40,44,47,49,50,51,53,54,55,57,56,54,53,51,49,47,42,32,
     *       30,40,45,48,49,51,52,53,55,57,56,55,53,52,51,49,46,42,31,
     *       30,41,45,48,50,51,53,54,58,57,55,54,53,51,50,48,45,41,31,
     *       31,41,46,49,51,52,54,59,57,56,55,53,52,51,49,47,45,40,30,
     *       31,42,47,50,52,53,59,58,56,55,54,53,51,50,48,47,44,40,30,
     *       32,42,47,50,52,59,58,56,55,54,53,51,50,49,48,46,43,39,29,
     *       32,43,48,51,59,57,56,55,53,52,51,50,49,48,47,45,43,39,28,
     *       32,43,48,58,57,55,54,53,52,51,50,49,48,47,46,44,42,38,28,
     *       32,43,57,56,55,54,53,52,51,50,49,48,47,46,45,44,41,37,27,
     *       33,56,55,54,53,52,51,50,49,48,47,47,46,45,44,43,41,38,27,
     *       56,55,54,53,52,51,50,49,48,47,46,46,45,44,43,42,39,31, 7/
      DATA R10/ 7,28,35,38,39,41,42,43,44,46,47,48,49,50,51,52,53,54,55,
     *       26,35,38,39,41,42,43,44,46,47,48,49,50,51,52,53,54,55,38,
     *       27,36,39,41,42,43,44,46,47,48,49,50,51,52,53,54,55,49,37,
     *       28,36,40,42,43,44,45,47,48,49,50,51,52,53,54,55,54,48,37,
     *       29,38,41,43,44,45,47,48,49,50,51,52,53,54,55,57,53,48,37,
     *       30,39,42,44,45,46,48,49,50,51,52,53,54,55,58,55,52,47,36,
     *       31,39,43,45,46,48,49,50,51,52,53,54,55,58,56,54,51,47,36,
     *       31,40,44,46,48,49,50,51,52,53,54,55,58,57,55,53,51,46,35,
     *       32,41,45,47,49,50,51,52,53,54,55,58,57,55,54,52,50,45,35,
     *       33,42,46,48,50,51,52,53,54,56,58,56,55,54,53,51,49,44,34,
     *       33,43,47,49,51,52,53,54,56,57,56,55,54,53,51,50,48,43,34,
     *       34,44,48,50,52,53,54,56,57,56,55,54,53,52,50,49,47,42,33,
     *       34,45,49,51,53,54,56,57,55,54,53,52,51,50,49,48,46,42,32,
     *       35,45,50,52,54,55,56,55,54,53,52,51,50,49,48,47,45,41,32,
     *       35,46,50,53,55,56,55,54,53,52,51,50,49,48,47,46,44,40,31,
     *       36,47,51,54,56,55,54,53,52,51,50,49,48,47,46,45,43,39,30,
     *       36,47,52,55,54,53,53,52,51,50,49,48,47,46,45,44,42,39,30,
     *       36,48,55,54,53,52,51,51,50,49,48,47,46,45,45,43,42,39,29,
     *       37,55,54,53,52,51,50,49,49,48,47,46,45,45,44,43,42,39,30,
     *       55,54,53,52,51,50,49,48,48,47,46,45,45,44,43,43,40,33, 8/
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      DATA R11/ 1, 6,12,17,21,24,27,30,33,36,39,41,44,46,48,50,52,53,55,
     *          4,11,16,20,24,27,30,33,35,38,41,43,45,47,49,51,53,55, 9,
     *          4,13,18,22,26,29,31,34,37,39,42,44,46,48,50,52,54,31, 9,
     *          5,14,21,25,28,30,33,35,38,40,43,45,47,49,51,53,41,30, 8,
     *          5,16,23,27,29,32,35,37,39,42,44,46,48,50,52,44,40,29, 8,
     *          5,17,24,28,31,34,36,38,40,43,45,47,49,51,45,43,39,29, 8,
     *          5,18,26,30,33,35,37,39,41,44,46,48,49,45,44,41,37,28, 8,
     *          6,20,28,32,34,36,38,41,43,45,47,48,46,44,42,40,36,27, 8,
     *          6,21,30,33,36,38,40,42,44,46,48,46,45,43,41,38,35,26, 8,
     *          6,22,31,35,37,40,42,43,45,47,47,45,43,41,39,37,33,24, 7,
     *          6,23,33,37,39,41,43,45,47,47,45,43,42,40,37,35,31,23, 7,
     *          6,25,34,38,41,43,45,46,48,46,44,42,40,38,36,33,30,22, 7,
     *          6,26,36,40,42,44,46,48,47,45,43,41,38,36,34,32,28,20, 7,
     *          7,27,37,41,44,46,49,47,46,44,41,39,37,35,33,30,27,19, 7,
     *          7,28,39,43,45,50,49,47,45,43,40,38,36,34,31,29,25,18, 6,
     *          7,29,40,44,51,50,48,46,44,42,39,37,35,32,30,27,23,17, 6,
     *          7,29,41,53,51,49,47,45,43,40,38,36,33,30,28,25,21,15, 6,
     *          7,30,54,52,50,48,46,44,42,39,37,34,32,29,26,23,19,14, 5,
     *          7,55,53,51,49,47,45,43,41,38,36,33,30,27,24,21,17,12, 5,
     *         55,53,52,50,48,46,44,41,39,36,33,31,27,24,21,17,13, 7, 1/
      DATA R12/ 2,10,18,23,26,30,33,36,39,42,44,46,48,50,52,54,56,58,59,
     *          8,17,22,26,29,33,36,39,41,44,46,48,50,52,54,56,57,59,17,
     *          9,19,25,29,32,35,38,40,43,45,47,50,51,53,55,57,58,42,16,
     *          9,21,28,31,34,37,40,42,44,47,49,51,53,54,56,58,52,42,16,
     *          9,24,31,34,36,39,41,44,46,48,50,52,54,55,57,52,50,41,16,
     *         10,26,33,36,38,40,43,45,47,49,51,53,55,56,52,51,49,40,16,
     *         10,28,36,38,40,42,44,46,48,50,52,54,56,52,51,50,48,39,15,
     *         10,29,38,40,42,43,46,48,50,52,53,55,52,50,49,48,46,38,15,
     *         11,31,40,42,43,45,47,49,51,53,54,52,51,49,48,47,45,37,15,
     *         11,32,41,44,45,46,48,50,52,54,53,51,49,47,46,45,43,35,14,
     *         11,34,43,45,46,48,49,51,53,54,52,50,48,46,45,44,42,34,14,
     *         11,35,45,47,48,49,51,52,54,53,51,49,47,45,43,42,40,32,13,
     *         12,36,46,49,49,50,52,55,53,52,50,48,46,44,42,40,38,31,13,
     *         12,37,48,50,51,52,56,54,52,50,48,47,44,42,40,38,36,29,12,
     *         12,38,49,51,52,56,55,53,51,49,47,45,43,41,38,36,34,27,12,
     *         12,39,50,53,57,55,54,52,50,48,46,44,41,39,36,34,31,25,11,
     *         12,40,51,58,56,54,53,51,49,47,45,42,40,37,34,32,28,22,11,
     *         12,41,58,57,55,53,52,50,48,46,43,41,38,35,32,29,26,20,10,
     *         13,59,58,56,54,52,50,49,47,44,42,39,37,34,30,27,23,18, 9,
     *         59,58,56,54,53,51,49,47,45,42,40,37,34,31,27,23,19,11, 3/
      DATA R13/ 4,14,21,26,29,33,36,39,42,44,46,48,50,52,54,56,58,59,60,
     *         12,21,26,29,32,36,39,41,44,46,48,50,52,54,56,57,59,60,24,
     *         12,23,29,32,35,38,41,43,45,48,50,52,53,55,57,58,60,49,23,
     *         13,26,32,35,37,40,42,45,47,49,51,53,55,56,58,60,56,48,23,
     *         13,28,34,37,39,42,44,46,48,50,52,54,56,58,59,56,55,47,22,
     *         14,30,37,39,41,44,46,48,50,52,54,55,57,59,56,55,54,46,22,
     *         14,32,39,42,43,45,47,49,51,53,55,57,58,55,54,54,52,45,22,
     *         15,34,41,44,45,47,49,51,53,54,56,58,56,54,53,52,51,43,21,
     *         15,36,43,45,47,48,50,52,54,56,57,56,54,53,51,51,49,42,21,
     *         16,37,45,47,48,50,52,54,55,57,56,55,53,51,50,49,47,41,20,
     *         16,39,47,49,50,51,53,55,56,57,55,54,52,50,48,47,46,39,19,
     *         16,40,49,51,51,53,54,56,57,56,54,52,50,49,47,46,44,38,19,
     *         17,41,50,52,53,54,56,58,56,55,53,51,49,47,45,44,42,36,18,
     *         17,43,52,54,54,55,58,57,55,53,52,50,48,45,43,42,40,34,17,
     *         17,44,53,55,56,59,57,56,54,52,50,48,46,44,42,40,38,32,16,
     *         18,45,55,57,59,58,56,54,53,51,49,47,45,42,40,38,35,30,16,
     *         18,46,56,60,58,57,55,53,51,49,47,45,43,40,38,35,33,27,15,
     *         18,47,60,59,57,55,54,52,50,48,46,44,41,39,36,33,30,25,13,
     *        19,61,59,58,56,54,52,51,49,47,44,42,40,37,34,30,27,22,12,
     *        61,59,58,56,54,53,51,49,47,45,42,40,37,34,31,27,23,15, 4/
      DATA R14/ 4,17,24,28,31,34,37,40,42,45,47,49,51,53,55,56,58,60,61,
     *        15,24,28,31,34,37,39,42,45,47,49,51,53,55,56,58,60,61,30,
     *        16,26,31,34,37,39,42,44,46,49,51,53,54,56,58,59,61,54,29,
     *        16,29,34,37,39,42,44,46,48,50,52,54,56,58,59,61,59,52,29,
     *        17,31,36,39,42,44,46,48,50,52,54,56,57,59,60,59,58,52,28,
     *        18,33,39,41,43,46,48,50,52,54,55,57,59,60,58,57,56,50,28,
     *        19,35,41,44,45,47,49,51,53,55,57,58,60,58,57,56,55,49,27,
     *        19,37,44,46,47,49,51,53,55,56,58,60,58,57,55,54,53,48,27,
     *        20,39,46,48,49,51,52,54,56,58,59,58,57,55,54,53,52,46,26,
     *        20,41,48,49,51,52,54,56,58,59,59,57,56,54,52,51,50,45,25,
     *        21,43,50,51,52,54,56,57,59,59,58,56,54,52,51,50,48,43,25,
     *        21,44,51,53,54,55,57,58,59,58,56,55,53,51,49,48,47,41,24,
     *        22,46,53,55,55,56,58,60,58,57,55,53,51,49,48,46,44,39,23,
     *        22,47,55,56,57,58,60,58,57,55,54,52,50,48,46,44,42,37,22,
     *        22,48,56,58,58,60,59,57,56,54,52,50,48,46,44,42,40,35,21,
     *        23,49,57,59,61,59,58,56,54,53,51,49,47,45,42,40,38,33,19,
     *        23,50,59,61,60,58,56,55,53,51,49,47,45,43,40,38,35,30,18,
     *        23,51,61,60,58,57,55,53,51,49,47,45,43,40,38,35,32,28,17,
     *        24,61,60,58,57,55,53,52,50,48,45,43,41,38,36,33,30,25,16,
     *        61,60,59,57,55,53,52,50,48,46,43,41,38,36,33,30,26,18, 5/
      DATA R15/ 5,19,25,29,32,35,37,40,42,45,47,49,51,53,55,56,58,60,61,
     *        17,25,29,32,35,37,40,42,45,47,49,51,53,55,57,58,60,61,35,
     *        18,28,32,35,37,40,42,45,47,49,51,53,55,57,58,60,61,57,34,
     *        19,30,35,38,40,42,45,47,49,51,53,55,56,58,60,61,61,56,34,
     *        20,33,38,40,42,45,47,49,51,53,55,56,58,60,61,61,60,54,33,
     *        21,35,40,42,45,47,49,51,53,55,56,58,60,61,60,59,58,53,32,
     *        22,38,43,45,47,49,51,53,55,56,58,60,61,60,59,58,57,52,32,
     *        23,40,45,47,49,51,53,54,56,58,59,61,60,59,57,56,55,50,31,
     *        24,42,47,49,51,52,54,56,58,59,61,60,59,57,56,55,54,49,30,
     *        24,44,50,51,53,54,56,58,59,61,61,59,58,56,54,53,52,47,29,
     *        25,45,52,53,54,56,57,59,60,61,59,58,56,54,53,52,50,46,28,
     *        26,47,53,55,56,57,59,60,61,60,58,56,55,53,51,50,48,44,27,
     *        26,48,55,56,57,59,60,61,60,58,57,55,53,51,49,48,46,42,26,
     *        27,50,57,58,59,60,61,60,58,57,55,53,51,49,48,46,44,40,25,
     *        27,51,58,59,60,61,60,58,57,55,53,52,50,48,46,44,42,37,24,
     *        28,53,59,61,61,60,59,57,55,54,52,50,48,46,43,41,39,35,22,
     *        28,54,61,61,60,59,57,55,54,52,50,48,46,44,41,39,37,33,21,
     *        29,55,61,60,59,57,55,54,52,50,48,46,44,42,39,37,34,30,20,
     *        29,61,60,59,57,56,54,52,50,48,46,44,42,39,37,34,31,28,19,
     *        61,60,59,57,56,54,52,50,48,46,44,42,39,37,34,31,28,21, 6/
      DATA R16/ 3,12,18,22,26,29,32,35,37,39,40,42,44,45,46,48,49,50,52,
     *        10,16,21,25,28,31,34,36,38,39,41,43,44,46,47,48,50,51,15,
     *         9,15,20,23,27,29,31,34,36,37,39,41,42,44,45,47,48,21,15,
     *         9,15,19,22,25,28,30,32,34,36,37,39,40,42,43,45,25,21,15,
     *         9,14,18,21,24,27,29,31,33,35,36,38,39,41,42,28,25,21,15,
     *         9,14,18,21,24,26,28,30,32,34,36,37,39,40,30,27,25,21,15,
     *         9,14,18,21,24,26,28,30,32,34,35,37,39,31,29,27,24,21,15,
     *         9,14,18,21,24,26,28,30,31,33,35,36,33,31,29,27,25,21,15,
     *         9,14,18,21,24,26,28,30,31,33,35,35,33,31,29,27,24,20,15,
     *         9,15,18,21,24,26,28,30,32,33,37,36,34,32,30,27,24,20,15,
     *         9,15,18,21,24,26,28,30,32,39,38,36,34,32,30,27,24,20,14,
     *         9,14,18,22,24,26,28,30,41,39,37,35,34,32,29,27,24,20,14,
     *         9,15,19,22,24,26,28,42,41,39,37,35,33,31,29,27,23,20,14,
     *         9,15,19,22,24,26,44,42,41,39,37,35,33,31,29,26,23,19,14,
     *         9,15,19,22,24,46,45,43,41,39,38,35,33,31,29,26,23,19,14,
     *         9,15,19,22,49,47,45,44,42,40,38,36,34,31,29,26,23,19,14,
     *       9,15,19,52,50,48,46,45,43,41,39,37,35,32,30,26,23,19,14,
     *       9,15,54,53,51,50,48,46,45,43,41,39,36,34,31,28,24,19,13,
     *      10,58,57,55,54,52,51,49,47,45,43,41,39,36,33,30,25,20,13,
     *      59,58,56,55,53,52,50,49,47,45,42,40,37,34,31,27,22,16, 4/
      DATA R17/ 5,19,26,31,34,36,38,40,42,43,45,46,47,49,50,51,52,54,55,
     *      16,24,30,33,35,37,39,41,43,44,45,47,48,49,51,52,53,55,28,
     *      16,25,30,33,35,37,39,41,42,44,45,46,48,49,51,52,53,35,28,
     *      17,25,30,33,35,38,39,41,42,44,45,46,48,49,51,52,39,35,28,
     *      17,25,29,33,35,37,39,41,42,44,45,47,48,50,51,42,38,34,27,
     *      17,24,29,32,34,37,39,40,42,44,45,46,48,49,43,41,38,34,27,
     *      17,24,28,31,34,36,38,40,41,43,44,46,47,45,43,40,37,33,27,
     *      17,24,28,31,34,36,38,39,41,42,44,45,46,44,42,40,37,33,27,
     *      17,24,28,31,34,36,38,39,41,42,44,47,45,43,41,39,36,33,26,
     *      17,24,28,32,34,36,38,39,41,42,48,46,45,43,41,38,36,32,26,
     *      17,24,29,32,34,36,38,40,41,49,47,46,44,42,40,38,35,32,26,
     *      17,24,29,32,34,36,38,40,50,49,47,45,44,42,40,38,35,32,25,
     *      17,25,29,32,35,37,39,52,50,49,47,45,44,42,40,38,35,32,25,
     *      18,25,29,33,35,37,54,52,51,49,47,46,44,42,40,38,35,31,25,
     *      18,25,30,33,36,55,54,52,51,49,48,46,44,42,40,38,35,31,25,
     *      18,25,30,33,57,56,55,53,52,50,48,47,45,43,41,38,35,31,24,
     *      18,25,30,60,58,57,56,54,53,51,49,48,46,44,42,39,35,31,24,
     *      18,26,62,60,59,57,56,54,53,51,50,48,46,44,42,39,36,32,23,
     *      18,63,62,61,59,58,56,55,53,52,50,48,46,44,42,40,37,32,23,
     *      64,63,61,60,59,57,55,54,52,51,49,47,45,43,41,38,33,25, 7/
      DATA R18/ 6,23,31,35,38,40,42,43,45,46,47,49,50,51,52,53,54,55,56,
     *      21,29,34,37,39,41,43,44,46,47,48,49,50,51,53,54,55,56,36,
     *      20,30,34,37,40,41,43,44,46,47,48,50,51,52,53,54,56,47,36,
     *      21,30,35,38,40,42,44,45,46,48,49,50,52,53,54,55,50,46,36,
     *      21,31,35,38,41,43,44,46,47,48,49,51,52,53,55,52,50,46,35,
     *      21,31,36,39,41,43,44,46,47,49,50,51,53,54,54,52,49,45,35,
     *      22,31,36,39,42,43,45,46,48,49,50,52,53,55,53,51,49,45,35,
     *      22,31,37,40,42,44,46,47,48,50,51,53,55,54,52,50,48,44,35,
     *      22,32,37,40,43,44,46,48,49,50,52,56,55,53,52,50,48,44,34,
     *      22,32,37,41,43,45,47,49,50,51,57,56,54,53,51,50,47,43,34,
     *      22,32,38,41,44,46,48,49,50,58,57,56,54,53,51,49,47,42,33,
     *      22,33,38,42,45,47,48,50,60,58,57,56,54,53,51,49,46,42,33,
     *      23,33,39,43,45,47,49,61,59,58,57,55,53,52,50,48,45,41,32,
     *      23,33,39,43,46,48,61,60,59,57,56,54,53,51,49,47,45,41,32,
     *      23,34,40,44,46,63,61,60,58,57,55,54,52,51,49,47,44,40,32,
     *      23,34,40,44,63,62,61,59,58,56,55,53,52,50,48,46,44,40,31,
     *      23,34,41,65,63,62,61,59,58,56,55,53,52,50,48,46,43,39,30,
     *      23,35,66,64,63,62,60,59,57,56,55,53,51,50,48,45,43,38,29,
     *      24,65,64,63,61,60,59,57,56,55,54,52,51,49,47,45,42,38,29,
     *      65,64,63,61,60,59,57,56,55,54,52,51,49,47,45,43,39,31, 9/
      DATA R19/ 8,28,36,39,42,44,45,46,48,49,50,51,52,53,54,55,56,57,58,
     *      26,35,39,41,43,45,46,47,48,50,51,52,53,54,55,56,57,58,40,
     *      26,35,39,42,44,45,47,48,49,50,51,52,53,54,55,56,57,54,40,
     *      25,35,39,42,44,46,47,48,49,50,51,52,54,55,56,57,59,53,40,
     *      25,35,40,43,45,46,47,49,50,51,52,53,54,55,56,61,58,53,39,
     *      25,35,40,43,45,46,48,49,50,51,53,54,55,56,62,60,57,52,39,
     *      25,35,40,43,45,47,48,49,51,52,53,54,56,62,61,59,56,51,39,
     *      25,36,41,44,46,48,49,50,52,53,54,56,63,61,60,58,55,51,38,
     *      25,36,42,45,47,49,50,52,53,54,55,63,62,60,59,57,55,50,38,
     *      26,37,42,46,48,50,51,52,54,55,64,62,61,60,58,56,54,49,37,
     *      26,37,43,46,49,50,52,53,55,64,63,61,60,59,57,56,53,48,37,
     *      26,38,44,47,50,51,53,54,65,63,62,61,59,58,56,55,52,47,36,
     *      27,38,44,48,50,52,54,65,64,63,61,60,59,57,56,54,51,46,36,
     *      27,39,45,49,51,53,66,64,63,62,60,59,57,56,54,53,50,46,35,
      *        27,39.46,49.52,66,64,63.62,60,59.57.56,55.53.51.49.45.34,
      *        27,40.46,50,65,64,63,61,60,59,57.56.55.54.52.50.48.44.34,
      *        27,40.47,65.63,62.61,60.58,57.56.55.54.53.51,49.47.43.33.
      *        27,41,64,63.61,60.59.58.57.56.55.54.53.52.50.49.46.42.32.
      *        28,63,62,60.59.58.57.56.55.54.53.52.51.50.49.48.46.42.32.
      *        62,61,60.59.58.57.56.55.54.53.52.51.50,49.48.46.43.35.10/
      DATA R20/ 9.32,38.41.43.45.47.48.49.50.51.52.54.55.56.57.58.59.60.
      *        29,38.41,43.45,47.48.49.50,51.52.54.55.56.57.58.59.60.42.
      *        30,39.43.45.46,48,49.50.51.52.53.54.55.57.57.58.59.56.42.
      *        31,40,43,46,47.48.50.51.52.53.54.55.56.57.58.59.61.55.41,
      *        31.40,44.46.48.49.50.51.52.54.55.56.57.58.59.64.60.54.41.
      *        31,41,45,47.48.50.51.52.53.54.55.56.57.58.65.62.59.54.40.
      *        31,41,45.48.49.51.52.53.54.55.56.57.58.65.63.61.58.53.40.
      *        31,42.46.48.50.51.52.53.54.55.56.58.65.64.62.60.57.52.40.
      *        31,42.46,49.51.52.53.54.55.56.57.65.64.62.60.59.56.51.39.
      *        31,42,47.50.51.53.54.55.56.57.65.63.62.61.59.57.55.50.38.
      *        31,42.47,50,52.53.55.56.57.64.63.62.61.59.58.56.54.49.38.
      *        31,43.48.51.53.54.55.57.64.63.62.60.59.58.57.55.53.48.37.
      *        31,43.48.51.53.55.56.63.62.61,60.59.58.57.55.54.51.47.36.
      *        31,43.49.52.54.56,63.61.60.59.58.57.56.55.54.53.50.46.36.
      *        31,43.49.53.55.62,61,60.59.58.57.56.55.54.53.51.49.45.35.
      *        31,44.50.53.62.61.60.59.58.57.56.55.54.53.52.51.49.45.35.
      *        31,44.50,62.61,60,59.58.57.56.55.54.53.52.51.50.48.45.35.
      *        31,44,62,61,60.59.58.57.56.55.54.53.52.52.51.50.48.44.35.
      *        32.62.61.60.59.58.57.56.55.55.54.53.52.51.50.49.48.45.36.
      *        62,61,60.59.58.57.56.56.55.54.53.52.51.50.50.48.46.38.11/
C       TECHNOLOGY 4 REDUCTIONS:
      DATA T1/ 8,23.28.31,33.35.36.36.37.37.38.38.38.38.39.39.39.39.39.
      *        24,28,31.33.35.36.36.37.37.38.38.38.38.39.39.39.39.39.36.
      *        29.31.33.35.36.36.37.37.38.38.38.39.39.39.39.39.39.36.36.
      *        32,34.35.36.37.37.38.38.38.38.39.39.39.39.39.39.35.35.36.
      *        34.35.36.37.37.38.38.38.38.39.39.39.39.39.39.35.35.35.36.
      *        35.36.37.37.38,38.38.39.39.39.39.39.39.39.35.35.35.35.35.
      *        36.37.38.38.38.38.39.39.39.39.39.39.39.34.34.35.35.35.35.
      *        37.38.38.38.39.39.39.39.39.39.39.40.34.34.34.34.35.35.35.
      *        38,38.39.39.39.39.39.39.39.40.40.34.34.34.34.34.35.35.35.
      *        38,39.39.39.39.39.40,40.40.40.33.34.34.34.34.34.34.35.35.
      *        39.39.39.39.40,40.40.40.40.33.33.33.34.34.34.34.34.34.35.
      *        39,40,40,40,40,40,40,40.33.33.33.33.33.33.34.34.34.34.34.
      *        40,40,40,40,40,40,40.33.33.33.33.33.33.33.33.34.34.34.34.
      *        40,40,40,40,40,40.32.32.33.33.33.33.33.33.33.33.33.34.34.
      *        40,40,40,40,40,32.32.32.32.33.33.33.33.33.33.33.33.33.33.
      *        41,41,41,41.32,32.32.32.32.32.33.33.33.33.33.33.33.33.32.
      *        41,41,41.32.32.32.32.32.32.32.32.33.33.33.33.33.32.32.32.
      *        41,41,32.32.32.32.32.32.32.32.32.32.32.32.32.32.32.31.30.
      *        41,32,32,32.32.32.32.32.32.32.32.32.32.32.32.32.31.30.28.
      *        32.32.32.32.32.32.32.32.32.32.32.32.32.32.31.31.30.28. 9/
      DATA T2/ 9.26.31.34.36.38.39.40.40.41.41.41.42.42.42.42.42.42.43.
      *        26,31.34.36.38.39.40.40.41,41,41.42,42,42.42.42.42.43.43.
      *        31,34.36.38.39.40.40.41.41.41.42.42.42.42.42.43.43.43.43.
      *        35.37.38.39.40.40,41.41.42.42.42.42.42.42.43.43.43.43.43.
      *        37.38.39.40.40.41,41,42.42.42.42.42.43.43.43.42.42.43.43.
      *        38.39.40.41,41,41,42.42.42.42.42.43.43.43.42.42.42.42.43.
      *        39.40.41,41,42.42.42.42.42.43.43.43.43.42.42.42.42.42.42.
      *        40,41,41,42.42.42.42.43.43.43.43.43.41.41.42.42.42.42.42.
      *        41,42.42.42.42.43.43.43.43.43.43.41.41.41.41.41.42.42.42.
      *        42,42,42,43,43.43.43.43.43.43.41,41,41,41,41,41,41,42,42,
      *        42,43,43,43,43.43.43.43.43.40,41,41,41,41,41,41,41,41,41,
     *        43,43,43,43,43,43,43,44,40,40,40,40,41,41,41,41,41,41,41,
     *        43,43,43,43,44,44,44,40,40,40,40,40,40,40,41,41,41,41,41,
     *        43,43,44,44,44,44,40,40,40,40,40,40,40,40,40,40,40,40,40,
     *        44,44,44,44,44,40,40,40,40,40,40,40,40,40,40,40,40,40,40,
     *        44,44,44,44,39,39,39,40,40,40,40,40,40,40,40,40,40,39,39,
     *        44,44,44,39,39,39,39,39,40,40,40,40,40,40,39,39,39,39,38,
     *        44,44,39,39,39,39,39,39,39,39,39,39,39,39,39,39,38,38,36,
     *        45,39,39,39,39,39,39,39,39,39,39,39,39,39,39,38,37,36,34,
     *        39,39,39,39,39,39,39,39,39,39,39,39,39,39,38,37,36,33,11/
      DATA T3/ 9,29,34,37,39,41,42,43,44,44,45,45,45,45,46,46,46,46,46,
     *        29,34,37,39,41,42,43,44,44,45,45,45,45,46,46,46,46,46,50,
     *        34,37,40,41,42,43,44,44,45,45,45,46,46,46,46,46,46,50,50,
     *        38,40,41,42,43,44,44,45,45,45,46,46,46,46,46,46,50,50,50,
     *        40,41,42,43,44,44,45,45,45,46,46,46,46,46,46,50,50,50,50,
     *        41,43,43,44,44,45,45,45,46,46,46,46,46,46,49,49,49,50,50,
     *        43,43,44,45,45,45,46,46,46,46,46,46,47,49,49,49,49,49,49,
     *        44,44,45,45,45,46,46,46,46,46,47,47,49,49,49,49,49,49,49,
     *        44,45,45,46,46,46,46,46,47,47,47,48,49,49,49,49,49,49,49,
     *        45,45,46,46,46,46,46,47,47,47,48,48,48,48,48,49,49,49,49,
     *        46,46,46,46,46,47,47,47,47,48,48,48,48,48,48,48,48,48,48,
     *        46,46,46,47,47,47,47,47,48,48,48,48,48,48,48,48,48,48,48,
     *        46,47,47,47,47,47,47,48,48,48,48,48,48,48,48,48,48,48,48,
     *        47,47,47,47,47,47,47,47,47,47,47,47,47,48,47,47,47,47,47,
     *        47,47,47,47,47,47,47,47,47,47,47,47,47,47,47,47,47,47,46,
     *        47,47,48,48,47,47,47,47,47,47,47,47,47,47,47,47,46,46,45,
     *        48,48,48,47,47,47,47,47,47,47,47,47,47,47,46,46,46,45,44,
     *        48,48,47,47,47,47,47,47,47,47,47,47,47,46,46,46,45,44,42,
     *        48,47,47,47,47,47,47,47,47,47,47,46,46,46,45,45,44,42,39,
     *        47,47,47,47,47,47,47,47,47,47,46,46,46,45,45,44,42,39,13/
      DATA T4/10,31,37,40,43,44,45,46,47,48,48,49,49,49,49,50,50,50,50,
     *        31,37,40,43,44,45,46,47,48,48,49,49,49,49,50,50,50,50,58,
     *        37,40,43,44,45,46,47,48,48,49,49,49,49,50,50,50,50,57,57,
     *        41,43,44,46,46,47,48,48,49,49,49,49,50,50,50,50,57,57,57,
     *        43,44,46,47,47,48,48,49,49,49,50,50,50,50,50,57,57,57,57,
     *        45,46,47,47,48,48,49,49,49,50,50,50,50,50,57,57,57,57,57,
     *        46,47,47,48,48,49,49,49,50,50,50,50,50,57,57,57,57,57,57,
     *        47,48,48,49,49,49,50,50,50,50,50,50,56,56,56,56,56,56,56,
     *        48,48,49,49,49,50,50,50,50,50,50,56,56,56,56,56,56,56,56,
     *        48,49,49,49,50,50,50,50,50,51,56,56,56,56,56,56,56,56,56,
     *        49,49,50,50,50,50,50,51,51,56,56,56,56,56,56,56,56,55,55,
     *        49,50,50,50,50,50,51,51,56,56,55,55,55,55,55,55,55,55,55,
     *        50,50,50,50,51,51,51,55,55,55,55,55,55,55,55,55,55,55,54,
     *        50,50,51,51,51,51,55,55,55,55,55,55,55,55,55,55,54,54,54,
     *        50,51,51,51,51,55,55,55,55,55,55,55,55,55,54,54,54,54,53,
     *        51,51,51,51,55,55,55,55,55,55,55,55,54,54,54,54,53,53,52,
     *        51,51,51,55,55,55,55,55,55,55,54,54,54,54,54,53,53,52,51,
     *        51,51,55,55,55,55,55,55,54,54,54,54,54,53,53,52,52,50,48,
     *        51,55,55,55,55,55,54,54,54,54,54,54,53,53,52,51,50,48,45,
     *        55,55,55,55,55,54,54,54,54,54,54,53,53,52,51,50,48,45,15/
      DATA T5/11,34,40,43,46,48,49,50,51,51,52,52,53,53,53,53,54,54,54,
     *        34,40,43,46,48,49,50,51,51,52,52,53,53,53,53,54,54,54,65,
     *        40,43,46,48,49,50,51,51,52,52,53,53,53,54,54,54,54,65,65,
     *        43,46,48,49,50,51,51,52,52,53,53,53,54,54,54,54,65,64,64,
     *        46,48,49,50,51,51,52,52,53,53,53,54,54,54,54,64,64,64,64,
     *        48,49,50,51,51,52,52,53,53,53,54,54,54,54,64,64,64,64,64,
     *        49,50,51,51,52,52,53,53,53,54,54,54,54,64,64,64,64,64,64,
     *        50,51,52,52,52,53,53,53,54,54,54,54,64,64,64,64,64,64,63,
     *        51,52,52,53,53,53,53,54,54,54,54,64,64,64,64,64,63,63,63,
           *      52,52,53,53,53,54,54,54,54,54,64,64,64,64,63,63,63,63,63,
           *      52,53,53,53,54,54,54,54,54,64,64,64,63,63,63,63,63,63,62,
           *      53,53,53,54,54,54,54,54,64,64,63,63,63,63,63,63,62,62,62,
           *      53,53,54,54,54,54,55,64,63,63,63,63,63,63,63,62,62,62,61,
           *      54,54,54,54,54,55,63,63,63,63,63,63,63,62,62,62,62,61,61,
           *      54,54,54,54,55,63,63,63,63,63,63,63,62,62,62,61,61,60,60,
           *      54,54,55,55,63,63,63,63,63,63,62,62,62,62,61,61,60,60,59,
           *      54,55,55,63,63,63,63,63,63,62,62,62,62,61,61,60,59,58,57,
           *      55,55,63,63,63,63,63,63,62,62,62,62,61,61,60,59,58,57,54,
           *      55,63,63,63,63,63,62,62,62,62,62,61,61,60,59,58,57,54,50,
           *      63,63,63,63,63,62,62,62,62,62,61,61,60,59,58,57,54,50,17/
      C
            END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 7
C
      COMMON/BEFGCM/EXMETH(3,8,3),IEXMYR(3,8,3)
C
C..EXMETH ( INDX, IV, IR )
C..IEXMYR (   IG, IV, IR )
C
C
      DIMENSION
     *   EXMET1(3,8),
     *   EXMET2(3,8),
     *   EXMET3(3,8),
     *   IEXMY1(3,8),
     *   IEXMY2(3,8),
     *   IEXMY3(3,8)
C
      EQUIVALENCE
     *   (EXMETH(1,1,1),EXMET1(1,1)),
     *   (EXMETH(1,1,2),EXMET2(1,1)),
     *   (EXMETH(1,1,3),EXMET3(1,1)),
     *   (IEXMYR(1,1,1),IEXMY1(1,1)),
     *   (IEXMYR(1,1,2),IEXMY2(1,1)),
     *   (IEXMYR(1,1,3),IEXMY3(1,1))
C
C
C..FRACTION OF TOTAL HC WHICH IS NOT METHANE ( 8 VEH. TYPES )
C
C..LOW ALT. 49-STATE
      DATA EXMET1/
     *   0.93,0.87,0.68,
     *   0.93,0.87,0.72,
     *   0.93,0.87,0.72,
     *   0.93,0.87,0.67,
     *   0.96,0.00,0.00,
     *   0.96,0.00,0.00,
     *   0.96,0.00,0.00,
     *   0.94,0.92,0.00/
C
C..CALIFORNIA
      DATA EXMET2/
     *   0.93,0.87,0.68,
     *   0.93,0.87,0.72,
     *   0.93,0.87,0.72,
     *   0.93,0.87,0.00,
     *   0.96,0.00,0.00,
     *   0.96,0.00,0.00,
     *   0.96,0.00,0.00,
     *   0.94,0.92,0.91/
C
C..HIGH ALT. 49-STATE
      DATA EXMET3/
     *   0.93,0.87,0.68,
     *   0.93,0.87,0.72,
     *   0.93,0.87,0.72,
     *   0.93,0.87,0.67,
     *   0.96,0.00,0.00,
     *   0.96,0.00,0.00,
     *   0.96,0.00,0.00,
     *   0.94,0.92,0.00/
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR 8 VEH. TYPES
C
C..LOW ALT. 49-STATE
      DATA IEXMY1/
     *   1974,1980,2020,
     *   1974,1984,2020,
     *   1978,1984,2020,
     *   1983,1984,2020,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   1977,2020,0000/
C
C..CALIFORNIA
      DATA IEXMY2/
     *   1974,1979,2020,
     *   1974,1980,2020,
     *   1977,1980,2020,
     *   1983,2020,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   1977,1981,2020/
C
C..HIGH ALT. 49-STATE
      DATA IEXMY3/
     *   1974,1980,2020,
     *   1974,1984,2020,
     *   1978,1984,2020,
     *   1983,1984,2020,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   1977,2020,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 8
C
      COMMON/HOTCOM/MAXHOT,HOTVAL(6,8,3),IHOTYS(6,8,3)
C
C..HOTVAL ( IG, IV, IR )
C..IHOTYS ( IG, IV, IR )
C
C
      DIMENSION
     *   HOTVA1(6,8),
     *   HOTVA2(6,8),
     *   HOTVA3(6,8),
     *   IHOTY1(6,8),
     *   IHOTY2(6,8),
     *   IHOTY3(6,8)
C
C
      EQUIVALENCE
     *    (HOTVAL(1,1,1),HOTVA1(1,1)),
     *    (HOTVAL(1,1,2),HOTVA2(1,1)),
     *    (HOTVAL(1,1,3),HOTVA3(1,1)),
     *    (IHOTYS(1,1,1),IHOTY1(1,1)),
     *    (IHOTYS(1,1,2),IHOTY2(1,1)),
     *    (IHOTYS(1,1,3),IHOTY3(1,1))
C
C
      DATA MAXHOT/6/
C
C..VALUE OF HOT SOAK EVAPORATIVE HC EMISSIONS ( 8 VEH. TYPES )
C
C..LOW ALT. 49-STATE
      DATA HOTVA1/
     *   14.67, 10.91,  8.27,  1.56,  0.63,  0.00,
     *   14.67, 10.91,  8.27,  1.56,  0.63,  0.00,
     *   12.70,  1.56,  0.63,  0.00,  0.00,  0.00,
     *   12.70,  0.86,  0.00,  0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    4.56,  7.00,  7.53,  0.00,  0.00,  0.00/
C
C..CALIFORNIA
      DATA HOTVA2/
     *   14.67, 10.91,  8.27,  1.56,  0.63,  0.00,
     *   14.67, 10.91,  8.27,  1.56,  0.63,  0.00,
     *   12.70,  5.78,  1.56,  0.63,  0.00,  0.00,
     *   12.70,  5.78,  1.56,  0.63,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    4.56,  6.76,  7.44,  1.56,  1.37,  0.63/
C
C..HIGH ALT. 49-STATE
      DATA HOTVA3/
     *   19.07, 14.18, 10.75,  8.27,  2.03,  0.82,
     *   19.07, 14.18, 10.75,  8.27,  2.03,  0.82,
     *   16.51, 16.51, 02.03,  0.82,  0.00,  0.00,
     *   16.51,  1.12,  0.00,  0.00,  0.00,  0.00,
     *   00.00, 00.00, 00.00,  0.00,  0.00,  0.00,
     *   00.00, 00.00, 00.00,  0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *    5.93,  9.10,  9.79,  0.00,  0.00,  0.00/
C
C..LAST YEAR OF MODEL YEAR GROUPS
C..LOW ALT. 49-STATE
      DATA IHOTY1/
     *   1970,1971,1977,1980,2020,0000,
     *   1970,1971,1977,1980,2020,0000,
     *   1978,1980,2020,0000,0000,0000,
     *   1983,2020,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000/
C
C..CALIFORNIA
      DATA IHOTY2/
     *   1969,1971,1977,1979,2020,0000,
     *   1969,1971,1977,1979,2020,0000,
     *   1972,1977,1979,2020,0000,0000,
     *   1972,1977,1979,2020,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   1977,1981,1983,1984,1985,2020/
C
C..HIGH ALT. 49-STATE
      DATA IHOTY3/
     *   1970,1971,1976,1977,1980,2020,
     *   1970,1971,1976,1977,1980,2020,
     *   1968,1978,1980,2020,0000,0000,
     *   1983,2020,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 9
C
      COMMON/TPDCOM/MAXTPD,TPDVAL(2,8,3),ITPDYS(2,8,3)
C
C..TPDVAL ( IG, IV, IR )
C..ITPDYS ( IG, IV, IR )
C
C
      DIMENSION
     *   TPDVA1(2,8),
     *   TPDVA2(2,8),
     *   TPDVA3(2,8),
     *   ITPDY1(2,8),
     *   ITPDY2(2,8),
     *   ITPDY3(2,8)
C
C
      EQUIVALENCE
     *   (TPDVAL(1,1,1),TPDVA1(1,1)),
     *   (TPDVAL(1,1,2),TPDVA2(1,1)),
     *   (TPDVAL(1,1,3),TPDVA3(1,1)),
     *   (ITPDYS(1,1,1),ITPDY1(1,1)),
     *   (ITPDYS(1,1,2),ITPDY2(1,1)),
     *   (ITPDYS(1,1,3),ITPDY3(1,1))
C
C
      DATA MAXTPD/2/
C
C..AVERAGE # OF TRIPS PER DAY ( 8 VEH. TYPES )
C
C..LOW ALT. 49-STATE
      DATA TPDVA1/
     *    3.05,  0.0,
     *    3.05,  0.0,
     *    3.05,  0.0,
     *    6.88,  0.0,
     *    3.05,  0.0,
     *    3.05,  0.0,
     *    6.65,  0.0,
     *    1.35,  0.0/
C
C..CALIFORNIA
      DATA TPDVA2/
     *    3.05,  0.00,
     *    3.05,  0.00,
     *    3.05,  0.00,
     *    6.88,  0.00,
     *    3.05,  0.0,
     *    3.05,  0.0,
     *    6.65,  0.0,
     *    1.35,  0.0/
C
C..HIGH ALT. 49-STATE
      DATA TPDVA3/
     *    3.05,  0.0,
     *    3.05,  0.0,
    *    3.05,  0.0,
    *    6.88,  0.0,
    *    3.05,  0.0,
    *    3.05,  0.0,
    *    6.65,  0.0,
    *    1.35,  0.0/
C
C..LAST YEAR OF MODEL YEAR GROUPS
C..LOW ALT. 49-STATE
     DATA ITPDY1/
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000/
C
C..CALIFORNIA
     DATA ITPDY2/
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000/
C
C..HIGH ALT. 49-STATE
     DATA ITPDY3/
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000,
    *   2020,0000/
C
     END
```

```
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 10
C
      COMMON/DIUCOM/MAXDIU,DIUVAL(6,8,3),IDIUYS(6,8,3)
C
C..DIUVAL ( IG, IV, IR )
C..IDIUYS ( IG, IV, IR )
C
C
      DIMENSION
     *   DIUVA1(6,8),
     *   DIUVA2(6,8),
     *   DIUVA3(6,8),
     *   IDIUY1(6,8),
     *   IDIUY2(6,8),
     *   IDIUY3(6,8)
C
C
      EQUIVALENCE
     *   (DIUVAL(1,1,1),DIUVA1(1,1)),
     *   (DIUVAL(1,1,2),DIUVA2(1,1)),
     *   (DIUVAL(1,1,3),DIUVA3(1,1)),
     *   (IDIUYS(1,1,1),IDIUY1(1,1)),
     *   (IDIUYS(1,1,2),IDIUY2(1,1)),
     *   (IDIUYS(1,1,3),IDIUY3(1,1))
C
C
      DATA MAXDIU/6/
C
C..VALUE OF DIURNAL EVAPORATIVE HC EMISSIONS ( 8 VEH. TYPES )
C
C..LOW ALT. 49-STATE
      DATA DIUVA1/
     *  26.08, 16.28,  8.98,  2.65,  1.07,  0.00,
     *  26.08, 16.28,  8.98,  2.65,  1.07,  0.00,
     *  31.90,  2.65,  1.07,  0.00,  0.00,  0.00,
     *  31.90,  1.47,  0.00,  0.00,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *   6.71,  8.44,  8.60,  0.00,  0.00,  0.00/
C
C..CALIFORNIA
      DATA DIUVA2/
     *  26.08, 16.28,  8.98,  2.65,  1.07,  0.00,
     *  26.08, 16.28,  8.98,  2.65,  1.07,  0.00,
     *  31.90, 12.49,  2.65,  1.07,  0.00,  0.00,
     *  31.90, 12.49,  2.65,  1.07,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *   6.71,  8.42,  8.99,  2.59,  2.33,  1.07/
C
C..HIGH ALT. 49-STATE
      DATA DIUVA3/
     *  33.90, 21.16, 11.67,  8.98,  3.45,  1.39,
     *  33.90, 21.16, 11.67,  8.98,  3.45,  1.39,
     *  41.47, 03.45, 01.39,  0.00,  0.00,  0.00,
     *  41.47,  1.91,  0.00,  0.00,  0.00,  0.00,
     *  00.00, 00.00, 00.00,  0.00,  0.00,  0.00,
     *  00.00, 00.00, 00.00,  0.00,  0.00,  0.00,
     *   0.00,  0.00,  0.00,  0.00,  0.00,  0.00,
     *  08.72, 10.97, 11.18,  0.00,  0.00,  0.00/
C
C..LAST YEAR OF MODEL YEAR GROUPS
C..LOW ALT. 49-STATE
      DATA IDIUY1/
     *  1970,1971,1977,1980,2020,0000,
     *  1970,1971,1977,1980,2020,0000,
     *  1978,1980,2020,0000,0000,0000,
     *  1983,2020,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  1977,1979,2020,0000,0000,0000/
C
C..CALIFORNIA
      DATA IDIUY2/
     *  1969,1971,1977,1979,2020,0000,
     *  1969,1971,1977,1979,2020,0000,
     *  1972,1977,1979,2020,0000,0000,
     *  1972,1977,1979,2020,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  1977,1981,1983,1984,1985,2020/
C
C..HIGH ALT. 49-STATE
      DATA IDIUY3/
     *  1970,1971,1976,1977,1980,2020,
     *  1970,1971,1976,1977,1980,2020,
     *  1978,1980,2020,0000,0000,0000,
     *  1983,2020,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  2020,0000,0000,0000,0000,0000,
     *  1977,1979,2020,0000,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 11
C
      COMMON/XMPCOM/MAXXMP,XMPVAL(2,8,3),IXMPYS(2,8,3)
C
C..XMPVAL ( IG, IV, IR )
C..IXMPYS ( IG, IV, IR )
C
C
      DIMENSION
     *   XMPVA1(2,8),
     *   XMPVA2(2,8),
     *   XMPVA3(2,8),
     *   IXMPY1(2,8),
     *   IXMPY2(2,8),
     *   IXMPY3(2,8)
C
C
      EQUIVALENCE
     *   (XMPVAL(1,1,1),XMPVA1(1,1)),
     *   (XMPVAL(1,1,2),XMPVA2(1,1)),
     *   (XMPVAL(1,1,3),XMPVA3(1,1)),
     *   (IXMPYS(1,1,1),IXMPY1(1,1)),
     *   (IXMPYS(1,1,2),IXMPY2(1,1)),
     *   (IXMPYS(1,1,3),IXMPY3(1,1))
C
C
      DATA MAXXMP/2/
C
C..AVERAGE # OF MILES PER DAY ( 8 VEH. TYPES )
C
C..LOW ALT. 49-STATE
      DATA XMPVA1/
     *    31.1,  0.0,
     *    26.3,  0.0,
     *    33.7,  0.0,
     *    36.7,  0.0,
     *    31.1,  0.0,
     *    29.8,  0.0,
     *   138.3,  0.0,
     *     8.3,  0.0/
C
C..CALIFORNIA
      DATA XMPVA2/
     *    31.10,  0.00,
     *    26.30,  0.00,
     *    33.70,  0.00,
     *    36.70,  0.00,
     *    31.1,  0.0,
     *    29.8,  0.0,
     *   138.3,  0.0,
     *     8.3,  0.0/
C
C..HIGH ALT. 49-STATE
      DATA XMPVA3/
     *    31.1,  0.0,
     *    26.3,  0.0,
     *    33.7,  0.0,
     *    36.7,  0.0,
     *    31.1,  0.0,
     *    29.8,  0.0,
     *   138.3,  0.0,
     *     8.3,  0.0/
C
C..LAST YEAR OF MODEL YEAR GROUPS
C..LOW ALT. 49-STATE
      DATA IXMPY1/
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000/
C
C..CALIFORNIA
      DATA IXMPY2/
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000/
C
C..HIGH ALT. 49-STATE
      DATA IXMPY3/
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000,
     *   2020,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 12
C
      COMMON/CRACOM/MAXCRA,CRAVAL(3,8,3),ICRAYS(3,8,3)
C
C..CRAVAL ( IG, IV, IR )
C..ICRAYS ( IG, IV, IR )
C
C
      DIMENSION
     *   CRAVA1(3,8),
     *   CRAVA2(3,8),
     *   CRAVA3(3,8),
     *   ICRAY1(3,8),
     *   ICRAY2(3,8),
     *   ICRAY3(3,8)
C
C
      EQUIVALENCE
     *   (CRAVAL(1,1,1),CRAVA1(1,1)),
     *   (CRAVAL(1,1,2),CRAVA2(1,1)),
     *   (CRAVAL(1,1,3),CRAVA3(1,1)),
     *   (ICRAYS(1,1,1),ICRAY1(1,1)),
     *   (ICRAYS(1,1,2),ICRAY2(1,1)),
     *   (ICRAYS(1,1,3),ICRAY3(1,1))
C
C
      DATA MAXCRA/3/
C
C..VALUE OF CRANCKCASE HC EMISSIONS ( 8 VEH. TYPES )
C
C..LOW ALT. 49-STATE
      DATA CRAVA1/
     *    4.10,  0.80,  0.00,
     *    4.10,  0.80,  0.00,
     *    5.70,  0.00,  0.00,
     *    5.70,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.31,  0.00,  0.00/
C
C..CALIFORNIA
      DATA CRAVA2/
     *    4.10,  0.80,  0.00,
     *    4.10,  0.80,  0.00,
     *    5.70,  0.80,  0.00,
     *    5.70,  0.80,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.31,  0.00,  0.00/
C
C..HIGH ALT. 49-STATE
      DATA CRAVA3/
     *    5.29,  1.03,  0.00,
     *    5.29,  1.03,  0.00,
     *    7.35,  0.00,  0.00,
     *    7.35,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.00,  0.00,  0.00,
     *    0.40,  0.00,  0.00/
C
C..LAST YEAR OF MODEL YEAR GROUPS
C..LOW ALT. 49-STATE
      DATA ICRAY1/
     *   1962,1967,2020,
     *   1962,1967,2020,
     *   1967,2020,0000,
     *   1967,2020,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   1977,2020,0000/
C
C..CALIFORNIA
      DATA ICRAY2/
     *   1960,1963,2020,
     *   1960,1963,2020,
     *   1960,1963,2020,
     *   1960,1963,2020,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   1977,2020,0000/
C
C..HIGH ALT. 49-STATE
      DATA ICRAY3/
     *   1962,1967,2020,
     *   1962,1967,2020,
     *   1967,2020,0000,
     *   1967,2020,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   2020,0000,0000,
     *   1977,2020,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 13
C
      COMMON/YEARS4/IY1951,IY1970,IY2020
      COMMON/ALTEQU/MAXEQU
      COMMON/SYSCOM/MAXVEH,MAXLTW,MAXPOL,MAXREG,INITPR
      COMMON/IVPCOM/IVPTRG(8),IVPTRT(8),IVPTRA(8),IVPTRB(8)
C
C
      DATA IY1951,IY1970,IY2020/
     *       1951,  1970,  2020/
C
      DATA MAXEQU/15/
C
      DATA MAXVEH/8/
C
      DATA MAXLTW/3/
C
      DATA MAXPOL/3/
C
      DATA MAXREG/3/
C
      DATA INITPR/1/
C
      DATA IVPTRG/1,2,3,0,4,5,0,6/
C
      DATA IVPTRT/1,2,3,0,4,5,0,6/
C
      DATA IVPTRA/1,2,3,0,0,0,0,4/
C
      DATA IVPTRB/0,0,0,1,2,3,4,0/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 14
C
      COMMON/TCFCOM/TTACOF(2,3,9,3,6),TT4COF(2,9,3),TT7COF(2,3)
C
C..TTACOF ( IT, IB, IG, IP, IV ) : IT=1 FOR LOW TEMP, 2 FOR HIGH
C..TT4COF ( IT, IG, IP )
C..TT7COF ( IT, IP )
C
      DIMENSION
     *   T11COF(2,3,9),T12COF(2,3,9),T13COF(2,3,9),
     *   T21COF(2,3,9),T22COF(2,3,9),T23COF(2,3,9),
     *   T31COF(2,3,9),T32COF(2,3,9),T33COF(2,3,9),
     *   T51COF(2,3,9),T52COF(2,3,9),T53COF(2,3,9),
     *   T61COF(2,3,9),T62COF(2,3,9),T63COF(2,3,9),
     *   T81COF(2,3,9),T82COF(2,3,9),T83COF(2,3,9)
C
      EQUIVALENCE
     *   (TTACOF(1,1,1,1,1),T11COF(1,1,1)),
     *   (TTACOF(1,1,1,1,2),T21COF(1,1,1)),
     *   (TTACOF(1,1,1,1,3),T31COF(1,1,1)),
     *   (TTACOF(1,1,1,1,4),T51COF(1,1,1)),
     *   (TTACOF(1,1,1,1,5),T61COF(1,1,1)),
     *   (TTACOF(1,1,1,1,6),T81COF(1,1,1)),
     *   (TTACOF(1,1,1,2,1),T12COF(1,1,1)),
     *   (TTACOF(1,1,1,2,2),T22COF(1,1,1)),
     *   (TTACOF(1,1,1,2,3),T32COF(1,1,1)),
     *   (TTACOF(1,1,1,2,4),T52COF(1,1,1)),
     *   (TTACOF(1,1,1,2,5),T62COF(1,1,1)),
     *   (TTACOF(1,1,1,2,6),T82COF(1,1,1)),
     *   (TTACOF(1,1,1,3,1),T13COF(1,1,1)),
     *   (TTACOF(1,1,1,3,2),T23COF(1,1,1)),
     *   (TTACOF(1,1,1,3,3),T33COF(1,1,1)),
     *   (TTACOF(1,1,1,3,4),T53COF(1,1,1)),
     *   (TTACOF(1,1,1,3,5),T63COF(1,1,1)),
     *   (TTACOF(1,1,1,3,6),T83COF(1,1,1))
C
C
      DIMENSION
     *   T41COF(2,9),
     *   T42COF(2,9),
     *   T43COF(2,9)
C
      EQUIVALENCE
     *   (TT4COF(1,1,1),T41COF(1,1)),
     *   (TT4COF(1,1,2),T42COF(1,1)),
     *   (TT4COF(1,1,3),T43COF(1,1))
C
C..TEMPERATURE CORRECTION FACTOR COEFICIENTS
C
C..LDGV
C..HC
C..          BAG 1                    BAG 2                    BAG 3
      DATA T11COF/
     *-.02062300,-.01438100,-.00240320, .00132190,-.00100810, .00347990,
     *-.02446200,-.01255200,-.00320170, .00426670,-.00086884, .00758430,
     *-.02125500,-.01088800,-.00052755,-.00047925, .00093659, .00766660,
     *-.02142700,-.00661070,-.00039442, .00262880, .00497310, .01232000,
     *-.02351700,-.01409500,-.00880570, .02617900,-.00162220, .02429700,
     *-.02351700,-.01409500,-.00880570, .02617900,-.00162220, .02429700,
     *-.02521700, .01195900,-.00561530,-.12627E-4,-.00362280, .00787650,
     *-.02521700, .01195900,-.00561530,-.12627E-4,-.00362280, .00787650,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..CO
      DATA T12COF/
     *-.01348700,-.01469100, .00157840, .00374620, .00110970, .01101400,
     *-.02112600,-.03876700,-.00152890, .00846850, .00157490, .02517900,
     *-.02084300,-.02116500,-.00599510, .02360300, .00182530, .02848300,
     *-.01909100,-.01314600,-.00042373, .02471700, .00579820, .02584800,
     *-.02483500,-.01961200,-.00883360, .04853700,-.00115530, .03143900,
     *-.02483500,-.01961200,-.00883360, .04853700,-.00115530, .03143900,
     *-.01826300,-.01259600,-.01404200, .01386100,-.00248130, .00969390,
     *-.01826300,-.01259600,-.01404200, .01386100,-.00248130, .00969390,
     *-.01826300,-.01259600,-.01404200, .01386100,-.00248130, .00969390/
C..NOX
      DATA T13COF/
     *-.00016897, .00388410,-.00892450,-.00873250,-.00725800,-.01083900,
     *-.00025074,-.00103890,-.00597910,-.00924660,-.00626900,-.01010800,
     * .00388550,-.01830100,-.00241560,-.01092500,-.00211880,-.01804200,
     *-.45504E-4,-.00714200,-.00125750,-.00879100,-.00053153,-.00754700,
     *-.00760440,-.02615300,-.00680450,-.01860300,-.00541980,-.02087800,
     *-.00760440,-.02615300,-.00680450,-.01860300,-.00541980,-.02087800,
     * .00156680,-.03441600, .00059496,-.03587100,-.00248880,-.02883000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C
C..LDGT1
C..HC
      DATA T21COF/
     *-.02062300,-.01438100,-.00240320, .00132190,-.00100810, .00347990,
     *-.02446200,-.01255200,-.00320170, .00426670,-.00086884, .00758430,
     *-.02125500,-.01088800,-.00052755,-.00047925, .00093659, .00766660,
     *-.02142700,-.00661070,-.00039442, .00262880, .00497310, .01232000,
     *-.02351700,-.01409500,-.00880570, .02617900,-.00162220, .02429700,
     *-.02351700,-.01409500,-.00880570, .02617900,-.00162220, .02429700,
     *-.02521700, .01195900,-.00561530,-.12627E-4,-.00362280, .00787650,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..CO
      DATA T22COF/
     *-.01348700,-.01469100, .00157840, .00374620, .00110970, .01101400,
     *-.02112600,-.03876700,-.00152890, .00846850, .00157490, .02517900,
     *-.02084300,-.02116500,-.00599510, .02360300, .00182530, .02848300,
     *-.01909100,-.01314600,-.00042373, .02471700, .00579820, .02584800,
     *-.02483500,-.01961200,-.00883360, .04853700,-.00115530, .03143900,
     *-.02483500,-.01961200,-.00883360, .04853700,-.00115530, .03143900,
     *-.01826300,-.01259600,-.01404200, .01386100,-.00248130, .00969390,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..NOX
      DATA T23COF/
     *-.00016897, .00388410,-.00892450,-.00873250,-.00725800,-.01083900,
     *-.00025074,-.00103890,-.00597910,-.00924660,-.00626900,-.01010800,
     * .00388550,-.01830100,-.00241560,-.01092500,-.00211880,-.01804200,
     *-.45504E-4,-.00714200,-.00125750,-.00879100,-.00053153,-.00754700,
     *-.00760440,-.02615300,-.00680450,-.01860300,-.00541980,-.02087800,
     *-.00760440,-.02615300,-.00680450,-.01860300,-.00541980,-.02087800,
     * .00156680,-.03441600, .00059496,-.03587100,-.00248880,-.02883000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C
C..LDGT2
C..HC
      DATA T31COF/
     *-.02062300,-.01438100,-.00240320, .00132190,-.00100810, .00347990,
     *-.02446200,-.01255200,-.00320170, .00426670,-.00086884, .00758430,
     *-.02142700,-.00661070,-.00039442, .00262880, .00497310, .01232000,
     *-.02351700,-.01409500,-.00880570, .02617900,-.00162220, .02429700,
     *-.02351700,-.01409500,-.00880570, .02617900,-.00162220, .02429700,
     *-.02521700, .01195900,-.00561530,-.12627E-4,-.00362280, .00787650,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..CO
      DATA T32COF/
     *-.01348700,-.01469100, .00157840, .00374620, .00110970, .01101400,
     *-.02112600,-.03876700,-.00152890, .00846850, .00157490, .02517900,
     *-.01909100,-.01314600,-.00042373, .02471700, .00579820, .02584800,
     *-.02483500,-.01961200,-.00883360, .04853700,-.00115530, .03143900,
     *-.02483500,-.01961200,-.00883360, .04853700,-.00115530, .03143900,
     *-.01826300,-.01259600,-.01404200, .01386100,-.00248130, .00969390,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..NOX
      DATA T33COF/
     *-.00016897, .00388410,-.00892450,-.00873250,-.00725800,-.01083900,
     *-.00025074,-.00103890,-.00597910,-.00924660,-.00626900,-.01010800,
     * .00388550,-.01830100,-.00241560,-.01092500,-.00211880,-.01804200,
     *-.00760440,-.02615300,-.00680450,-.01860300,-.00541980,-.02087800,
     *-.00760440,-.02615300,-.00680450,-.01860300,-.00541980,-.02087800,
     * .00156680,-.03441600, .00059496,-.03587100,-.00248880,-.02883000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C
C..HDGV
C..HC
      DATA T41COF/
     *-.00589030, .00134580,
     *-.00738700, .00523170,
     *-.00497590, .00546510,
     *-.00285490, .01008200,
     *-.00741070, .02054600,
     *-.00928590, .00848420,
     * .00000000, .00000000,
     * .00000000, .00000000,
     * .00000000, .00000000/
C
C..CO
      DATA T42COF/
     *-.00205760, .0081720,
     *-.00455410, .02026800,
     *-.00428990, .02412700,
     *-.00130850, .02206100,
     *-.00771170, .02701900,
     *-.00601950, .00714570,
     * .00000000, .00000000,
     * .00000000, .00000000,
     * .00000000, .00000000/
C
C..NOX
      DATA T43COF/
     *-.00643150,-.00839860,
     *-.00554560,-.00868800,
     *-.00139690,-.01807900,
     *-.00046352,-.00748890,
     *-.00575240,-.02159300,
     *-.00197330,-.02958400,
     * .00000000, .00000000,
     * .00000000, .00000000,
     * .00000000, .00000000/
C
C..LDDV
C..HC
      DATA T51COF/
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..CO
      DATA T52COF/
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..NOX
      DATA T53COF/
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C
C..LDDT
C..HC
      DATA T61COF/
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..CO
      DATA T62COF/
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..NOX
      DATA T63COF/
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C
C..HDDV
      DATA TT7COF/
     * 0.0000,  0.0000,
     * 0.0000,  0.0000,
     * 0.0000,  0.0000/
C
C..MC
C..HC
      DATA T81COF/
     *-.02062300,-.01438100,-.00240320, .00132190,-.00100810, .00347990,
     *-.02446200,-.01255200,-.00320170, .00426670,-.00086884, .00758430,
     *-.02125500,-.01088800,-.00052755,-.00047925, .00093659, .00766660,
     *-.02142700,-.00661070,-.00039442, .00262880, .00497310, .01232000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..CO
      DATA T82COF/
     *-.01348700,-.01469100, .00157840, .00374620, .00110970, .01101400,
     *-.02112600,-.03876700,-.00152890, .00846850, .00157490, .02517900,
     *-.02084300,-.02116500,-.00599510, .02360300, .00182530, .02848300,
     *-.01909100,-.01314600,-.00042373, .02471700, .00579820, .02584800,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C..NOX
      DATA T83COF/
     *-.00016897, .00388410,-.00892450,-.00873250,-.00725800,-.01083900,
     *-.00025074,-.00103890,-.00597910,-.00924660,-.00626900,-.01010800,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000,
     * .00000000, .00000000, .00000000, .00000000, .00000000, .00000000/
C
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 15
C
      COMMON/GPCCOM/GPACOF(8,9,3,6),GPBCOF(3,3,3,4)
C
C..GPACOF ( IC, IGPPTR, IP, IV ) : IC=COEF. NUM., IV=1,2,3,5,6,8
C
      DIMENSION
     *   GPAC11(8,9),GPAC12(8,9),GPAC13(8,9),
     *   GPAC21(8,9),GPAC22(8,9),GPAC23(8,9),
     *   GPAC31(8,9),GPAC32(8,9),GPAC33(8,9),
     *   GPAC51(8,9),GPAC52(8,9),GPAC53(8,9),
     *   GPAC61(8,9),GPAC62(8,9),GPAC63(8,9),
     *   GPAC81(8,9),GPAC82(8,9),GPAC83(8,9)
C
      EQUIVALENCE
     *  (GPACOF(1,1,1,1),GPAC11(1,1)),
     *  (GPACOF(1,1,1,2),GPAC21(1,1)),
     *  (GPACOF(1,1,1,3),GPAC31(1,1)),
     *  (GPACOF(1,1,1,4),GPAC51(1,1)),
     *  (GPACOF(1,1,1,5),GPAC61(1,1)),
     *  (GPACOF(1,1,1,6),GPAC81(1,1)),
     *  (GPACOF(1,1,2,1),GPAC12(1,1)),
     *  (GPACOF(1,1,2,2),GPAC22(1,1)),
     *  (GPACOF(1,1,2,3),GPAC32(1,1)),
     *  (GPACOF(1,1,2,4),GPAC52(1,1)),
     *  (GPACOF(1,1,2,5),GPAC62(1,1)),
     *  (GPACOF(1,1,2,6),GPAC82(1,1)),
     *  (GPACOF(1,1,3,1),GPAC13(1,1)),
     *  (GPACOF(1,1,3,2),GPAC23(1,1)),
     *  (GPACOF(1,1,3,3),GPAC33(1,1)),
     *  (GPACOF(1,1,3,4),GPAC53(1,1)),
     *  (GPACOF(1,1,3,5),GPAC63(1,1)),
     *  (GPACOF(1,1,3,6),GPAC83(1,1))
C
C..GPBCOF ( IC, IGPPTR, IP, IV ) : IC=COEF. NUM., IV=4,5,6,7
C
      DIMENSION
     *   GPBC04(3,3,3),
     *   GPBC05(3,3,3),
     *   GPBC06(3,3,3),
     *   GPBC07(3,3,3)
C
      EQUIVALENCE
     *   (GPBCOF(1,1,1,1),GPBC04(1,1,1)),
     *   (GPBCOF(1,1,1,2),GPBC05(1,1,1)),
     *   (GPBCOF(1,1,1,3),GPBC06(1,1,1)),
     *   (GPBCOF(1,1,1,4),GPBC07(1,1,1))
C
C..BAG & FTP EMISSIONS NORMALIZED BY ZERO MILE FTP RATE
C
C..LDGV
C..HC
C..      BAG 1            BAG 2            BAG 3            FTP
      DATA GPAC11/
     * 1.282, 0.025, 0.973, 0.028, 0.839, 0.019, 1.000, 0.025,
     * 1.345, 0.074, 0.946, 0.054, 0.842, 0.048, 1.000, 0.056,
     * 1.345, 0.178, 0.919, 0.118, 0.894, 0.093, 1.000, 0.124,
     * 1.398, 0.060, 0.885, 0.055, 0.919, 0.036, 1.000, 0.051,
     * 2.092, 0.248, 0.649, 0.254, 0.846, 0.152, 1.000, 0.225,
     * 2.092, 1.339, 0.649, 1.014, 0.846, 0.717, 1.000, 1.000,
     * 2.961, 0.154, 0.407, 0.585, 0.652, 0.552, 1.000, 0.487,
     * 2.961, 0.164, 0.407, 0.598, 0.652, 0.566, 1.000, 0.500,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..CO
      DATA GPAC12/
     * 1.277, 0.033, 1.017, 0.029, 0.758, 0.025, 1.000, 0.029,
     * 1.442, 0.071, 0.996, 0.042, 0.674, 0.033, 1.000, 0.046,
     * 1.553, 0.109, 0.933, 0.079, 0.711, 0.038, 1.000, 0.074,
     * 1.573, 0.054, 0.902, 0.079, 0.755, 0.029, 1.000, 0.060,
     * 2.413, 0.143, 0.608, 0.180, 0.681, 0.068, 1.000, 0.142,
     * 2.413, 0.657, 0.608, 0.503, 0.681, 0.251, 1.000, 0.466,
     * 3.184, 0.485, 0.345, 0.542, 0.601, 0.438, 1.000, 0.502,
     * 3.184, 0.516, 0.345, 0.564, 0.601, 0.457, 1.000, 0.525,
     * 3.184, 0.551, 0.345, 0.589, 0.601, 0.479, 1.000, 0.551/
C..NOX
      DATA GPAC13/
     * 1.121, 0.009, 0.785, 0.001, 1.319,-0.009, 1.000, 0.000,
     * 1.199,-0.004, 0.793,-0.002, 1.245, 0.006, 1.000, 0.000,
     * 1.262, 0.022, 0.770, 0.004, 1.242, 0.027, 1.000, 0.014,
     * 1.311, 0.021, 0.774, 0.010, 1.198, 0.026, 1.000, 0.017,
     * 1.393, 0.050, 0.754, 0.052, 1.172, 0.079, 1.000, 0.059,
     * 1.393, 0.056, 0.754, 0.056, 1.172, 0.085, 1.000, 0.064,
     * 1.801, 0.169, 0.653, 0.141, 1.059, 0.296, 1.000, 0.189,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C
C..LDGT1
C..HC
      DATA GPAC21/
     * 1.282, 0.025, 0.973, 0.028, 0.839, 0.019, 1.000, 0.025,
     * 1.345, 0.074, 0.946, 0.054, 0.842, 0.048, 1.000, 0.056,
     * 1.345, 0.178, 0.919, 0.118, 0.894, 0.093, 1.000, 0.124,
     * 1.398, 0.060, 0.885, 0.055, 0.919, 0.036, 1.000, 0.051,
     * 2.092, 0.248, 0.649, 0.254, 0.846, 0.152, 1.000, 0.225,
     * 2.092, 1.339, 0.649, 1.014, 0.846, 0.717, 1.000, 1.000,
     * 2.961, 0.164, 0.407, 0.598, 0.652, 0.566, 1.000, 0.500,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..CO
      DATA GPAC22/
     * 1.277, 0.033, 1.017, 0.029, 0.758, 0.025, 1.000, 0.029,
     * 1.442, 0.071, 0.996, 0.042, 0.674, 0.033, 1.000, 0.046,
     * 1.553, 0.109, 0.933, 0.079, 0.711, 0.038, 1.000, 0.074,
     * 1.573, 0.054, 0.902, 0.079, 0.755, 0.029, 1.000, 0.060,
     * 2.413, 0.143, 0.608, 0.180, 0.681, 0.068, 1.000, 0.142,
     * 2.413, 0.657, 0.608, 0.503, 0.681, 0.251, 1.000, 0.466,
     * 3.184, 0.551, 0.345, 0.589, 0.601, 0.479, 1.000, 0.551,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..NOX
      DATA GPAC23/
     * 1.121, 0.009, 0.785, 0.001, 1.319,-0.009, 1.000, 0.000,
     * 1.199,-0.004, 0.793,-0.002, 1.245, 0.006, 1.000, 0.000,
     * 1.262, 0.022, 0.770, 0.004, 1.242, 0.027, 1.000, 0.014,
     * 1.311, 0.021, 0.774, 0.010, 1.198, 0.026, 1.000, 0.017,
     * 1.393, 0.050, 0.754, 0.052, 1.172, 0.079, 1.000, 0.059,
     * 1.393, 0.056, 0.754, 0.056, 1.172, 0.085, 1.000, 0.064,
     * 1.801, 0.169, 0.653, 0.141, 1.059, 0.296, 1.000, 0.189,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C
C..LDGT2
C..HC
      DATA GPAC31/
     * 1.282, 0.025, 0.973, 0.028, 0.839, 0.019, 1.000, 0.025,
     * 1.345, 0.074, 0.946, 0.054, 0.842, 0.048, 1.000, 0.056,
     * 1.398, 0.060, 0.885, 0.055, 0.919, 0.036, 1.000, 0.051,
     * 2.092, 0.248, 0.649, 0.254, 0.846, 0.152, 1.000, 0.225,
     * 2.092, 1.339, 0.649, 1.014, 0.846, 0.717, 1.000, 1.000,
     * 2.961, 0.164, 0.407, 0.598, 0.652, 0.566, 1.000, 0.500,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..CO
      DATA GPAC32/
     * 1.277, 0.033, 1.017, 0.029, 0.758, 0.025, 1.000, 0.029,
     * 1.442, 0.071, 0.996, 0.042, 0.674, 0.033, 1.000, 0.046,
     * 1.573, 0.054, 0.902, 0.079, 0.755, 0.029, 1.000, 0.060,
     * 2.413, 0.143, 0.608, 0.180, 0.681, 0.068, 1.000, 0.142,
     * 2.413, 0.657, 0.608, 0.503, 0.681, 0.251, 1.000, 0.466,
     * 3.184, 0.551, 0.345, 0.589, 0.601, 0.479, 1.000, 0.551,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..NOX
      DATA GPAC33/
     * 1.121, 0.009, 0.785, 0.001, 1.319,-0.009, 1.000, 0.000,
     * 1.199,-0.004, 0.793,-0.002, 1.245, 0.006, 1.000, 0.000,
     * 1.262, 0.022, 0.770, 0.004, 1.242, 0.027, 1.000, 0.014,
     * 1.393, 0.050, 0.754, 0.052, 1.172, 0.079, 1.000, 0.059,
     * 1.393, 0.056, 0.754, 0.056, 1.172, 0.085, 1.000, 0.064,
     * 1.801, 0.169, 0.653, 0.141, 1.059, 0.296, 1.000, 0.189,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C
C..LDDV
C..HC
      DATA GPAC51/
     * 1.209, 0.071, 1.073, 0.056, 0.703, 0.064, 1.000, 0.061,
     * 1.209, 0.136, 1.073, 0.111, 0.703, 0.110, 1.000, 0.116,
     * 1.209, 0.068, 1.073, 0.053, 0.703, 0.062, 1.000, 0.059,
     * 1.209, 0.101, 1.073, 0.081, 0.703, 0.085, 1.000, 0.086,
     * 1.209, 0.082, 1.073, 0.065, 0.703, 0.072, 1.000, 0.070,
     * 1.209, 0.090, 1.073, 0.072, 0.703, 0.077, 1.000, 0.077,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..CO
      DATA GPAC52/
     * 1.199, 0.060, 0.935, 0.042, 0.974, 0.051, 1.000, 0.048,
     * 1.199, 0.062, 0.935, 0.044, 0.974, 0.053, 1.000, 0.050,
     * 1.199, 0.071, 0.935, 0.051, 0.974, 0.060, 1.000, 0.058,
     * 1.199, 0.076, 0.935, 0.055, 0.974, 0.064, 1.000, 0.062,
     * 1.199, 0.065, 0.935, 0.046, 0.974, 0.055, 1.000, 0.052,
     * 1.199, 0.049, 0.935, 0.034, 0.974, 0.042, 1.000, 0.039,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..NOX
      DATA GPAC53/
     * 1.068, 0.026, 0.981, 0.029, 0.985, 0.026, 1.000, 0.028,
     * 1.068, 0.015, 0.981, 0.018, 0.985, 0.015, 1.000, 0.017,
     * 1.068, 0.053, 0.981, 0.054, 0.985, 0.050, 1.000, 0.053,
     * 1.068, 0.030, 0.981, 0.032, 0.985, 0.029, 1.000, 0.031,
     * 1.068, 0.040, 0.981, 0.042, 0.985, 0.039, 1.000, 0.041,
     * 1.068, 0.040, 0.981, 0.042, 0.985, 0.038, 1.000, 0.040,
     * 1.068, 0.054, 0.981, 0.055, 0.985, 0.052, 1.000, 0.054,
     * 1.068, 0.067, 0.981, 0.068, 0.985, 0.064, 1.000, 0.067,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C
C..LDDT
C..HC
      DATA GPAC61/
     * 1.209, 0.112, 1.073, 0.091, 0.703, 0.093, 1.000, 0.096,
     * 1.209, 0.110, 1.073, 0.089, 0.703, 0.092, 1.000, 0.094,
     * 1.209, 0.110, 1.073, 0.089, 0.703, 0.092, 1.000, 0.094,
     * 1.209, 0.115, 1.073, 0.093, 0.703, 0.095, 1.000, 0.098,
     * 1.209, 0.090, 1.073, 0.072, 0.703, 0.077, 1.000, 0.077,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..CO
      DATA GPAC62/
     * 1.199, 0.062, 0.935, 0.044, 0.974, 0.053, 1.000, 0.050,
     * 1.199, 0.060, 0.935, 0.043, 0.974, 0.051, 1.000, 0.049,
     * 1.199, 0.057, 0.935, 0.040, 0.974, 0.048, 1.000, 0.046,
     * 1.199, 0.057, 0.935, 0.040, 0.974, 0.048, 1.000, 0.046,
     * 1.199, 0.049, 0.935, 0.034, 0.974, 0.042, 1.000, 0.039,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..NOX
      DATA GPAC63/
     * 1.068, 0.033, 0.981, 0.036, 0.985, 0.032, 1.000, 0.034,
     * 1.068, 0.033, 0.981, 0.035, 0.985, 0.032, 1.000, 0.034,
     * 1.068, 0.036, 0.981, 0.038, 0.985, 0.035, 1.000, 0.037,
     * 1.068, 0.071, 0.981, 0.072, 0.985, 0.068, 1.000, 0.071,
     * 1.068, 0.040, 0.981, 0.042, 0.985, 0.038, 1.000, 0.040,
     * 1.068, 0.071, 0.981, 0.072, 0.985, 0.068, 1.000, 0.071,
     * 1.068, 0.040, 0.981, 0.042, 0.985, 0.038, 1.000, 0.040,
     * 1.068, 0.054, 0.981, 0.055, 0.985, 0.052, 1.000, 0.054,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C
C..MC
C..HC
      DATA GPAC81/
     * 1.282, 0.025, 0.973, 0.028, 0.839, 0.019, 1.000, 0.025,
     * 1.345, 0.074, 0.946, 0.054, 0.842, 0.048, 1.000, 0.056,
     * 1.345, 0.178, 0.919, 0.118, 0.894, 0.093, 1.000, 0.124,
     * 1.398, 0.060, 0.885, 0.055, 0.919, 0.036, 1.000, 0.051,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..CO
      DATA GPAC82/
     * 1.277, 0.033, 1.017, 0.029, 0.758, 0.025, 1.000, 0.029,
     * 1.442, 0.071, 0.996, 0.042, 0.674, 0.033, 1.000, 0.046,
     * 1.553, 0.109, 0.933, 0.079, 0.711, 0.038, 1.000, 0.074,
     * 1.573, 0.054, 0.902, 0.079, 0.755, 0.029, 1.000, 0.060,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C..NOX
      DATA GPAC83/
     * 1.121, 0.009, 0.785, 0.001, 1.319,-0.009, 1.000, 0.000,
     * 1.199,-0.004, 0.793,-0.002, 1.245, 0.006, 1.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000,
     * 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000, 0.000/
C
C..SPEED CORRECTION FACTOR COEFICIENTS : HEAVY DUTY AND DIESEL
C
C..HDGV
      DATA GPBC04/
     * 1.608, -.097,  .00083,
     * 1.520, -.098,  .00110,
     *  .824,  .0088, .00000,
     * 1.608, -.097,  .00083,
     * 1.520, -.098,  .00110,
     *  .824,  .0088, .00000,
     * 1.608, -.097,  .00083,
     * 1.520, -.098,  .00110,
     *  .824,  .0088,  .0000/
C
C..LDDV
      DATA GPBC05/
     *  .9090, -.055, .00044,
     * 1.3752, -.088, .00091,
     *  .6680, -.048, .00071,
     *  .9090, -.055, .00044,
     * 1.3752, -.088, .00091,
     *  .6680, -.048, .00071,
     *  .9090, -.055, .00044,
     * 1.3752, -.088, .00091,
     *  .6680, -.048, .00071/
C
C..LDDT
```

```
      DATA GPBC06/
     *  .9090, -.055, .00044,
     * 1.3752, -.088, .00091,
     *  .6680, -.048, .00071,
     *  .9090, -.055, .00044,
     * 1.3752, -.088, .00091,
     *  .6680, -.048, .00071,
     *  .9090, -.055, .00044,
     * 1.3752, -.088, .00091,
     *  .6680, -.048, .00071/
C
C..HDDV
      DATA GPBC07/
     *  .924, -.055, .00044,
     * 1.396, -.088, .00091,
     *  .676, -.048, .00071,
     *  .924, -.055, .00044,
     * 1.396, -.088, .00091,
     *  .676, -.048, .00071,
     *  .924, -.055, .00044,
     * 1.396, -.088, .00091,
     *  .676, -.048, .00071/
C
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 16
C
      COMMON/PTRCOM/MAXIGP,IGPYRS(9,3,3,8)
C
C..IGPYRS ( IG, IP, IR, IV )
C
      DIMENSION
     *    IGPYR1(9,3,3),
     *    IGPYR2(9,3,3),
     *    IGPYR3(9,3,3),
     *    IGPYR4(9,3,3),
     *    IGPYR5(9,3,3),
     *    IGPYR6(9,3,3),
     *    IGPYR7(9,3,3),
     *    IGPYR8(9,3,3)
C
      EQUIVALENCE
     *    (IGPYRS(1,1,1,1),IGPYR1(1,1,1)),
     *    (IGPYRS(1,1,1,2),IGPYR2(1,1,1)),
     *    (IGPYRS(1,1,1,3),IGPYR3(1,1,1)),
     *    (IGPYRS(1,1,1,4),IGPYR4(1,1,1)),
     *    (IGPYRS(1,1,1,5),IGPYR5(1,1,1)),
     *    (IGPYRS(1,1,1,6),IGPYR6(1,1,1)),
     *    (IGPYRS(1,1,1,7),IGPYR7(1,1,1)),
     *    (IGPYRS(1,1,1,8),IGPYR8(1,1,1))
C
C
      DATA MAXIGP/9/
C
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR TEMP. C.F. & NORM. BAG FRACTIONS
C
      DATA IGPYR1/
C..LOW ALT. 49-STATE
     *    1967,1969,1971,1974,1979,1980,1981,2020,0000,
     *    1967,1969,1971,1974,1979,1980,1981,1982,2020,
     *    1967,1972,1974,1976,1979,1980,2020,0000,0000,
C..CALIFORNIA
     *    1965,1969,1971,1974,1976,1979,0000,2020,0000,
     *    1965,1969,1971,1974,1976,1979,0000,0000,2020,
     *    1965,1970,1974,0000,1976,1979,2020,0000,0000,
C..HIGH ALT. 49-STATE
     *    1967,1969,1971,1974,1979,1980,1981,2020,0000,
     *    1967,1969,1971,1974,1979,1980,1981,1982,2020,
     *    1967,1972,1974,1976,1979,1980,2020,0000,0000/
C
C
      DATA IGPYR2/
C..LOW ALT. 49-STATE
     *    1967,1969,1971,1974,1980,1984,2020,0000,0000,
     *    1967,1969,1971,1974,1980,1984,2020,0000,0000,
     *    1967,1972,1974,1978,1980,1984,2020,0000,0000,
C..CALIFORNIA
     *    1965,1969,1971,1974,1978,1980,2020,0000,0000,
     *    1965,1969,1971,1974,1978,1980,2020,0000,0000,
     *    1965,1970,1974,0000,1978,1980,2020,0000,0000,
C..HIGH ALT. 49-STATE
     *   1967,1969,1971,1974,1980,1984,2020,0000,0000,
     *   1967,1969,1971,1974,1980,1984,2020,0000,0000,
     *   1967,1972,1974,1978,1980,1984,2020,0000,0000/
C
C
      DATA IGPYR3/
C..LOW ALT. 49-STATE
     *   1969,1973,1978,1980,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1980,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1980,1984,2020,0000,0000,0000,
C..CALIFORNIA
     *   1968,1971,1977,1980,0000,2020,0000,0000,0000,
     *   1968,1971,1977,1980,0000,2020,0000,0000,0000,
     *   1968,1972,1977,1980,0000,2020,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   1969,1973,1978,1980,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1980,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1980,1984,2020,0000,0000,0000/
C
C
      DATA IGPYR4/
C..LOW ALT. 49-STATE
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,
C..CALIFORNIA
     *   1968,1971,1976,1983,2020,0000,0000,0000,0000,
     *   1968,1971,1976,1983,2020,0000,0000,0000,0000,
     *   1968,1972,1976,1983,2020,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000,
     *   1969,1973,1978,1983,1984,2020,0000,0000,0000/
C
C
      DATA IGPYR5/
C..LOW ALT. 49-STATE
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,
     *   1974,1976,1977,1978,1979,1980,1982,2020,0000,
C..CALIFORNIA
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,
     *   1974,1976,1977,1978,1979,0000,1981,2020,0000,
C..HIGH ALT. 49-STATE
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,
     *   1974,1976,1977,1978,1979,2020,0000,0000,0000,
     *   1974,1976,1977,1978,1979,1980,1982,2020,0000/
C
C
      DATA IGPYR6/
C..LOW ALT. 49-STATE
     *   1978,1979,1982,2020,0000,0000,0000,0000,0000,
     *   1978,1979,1982,2020,0000,0000,0000,0000,0000,
     *   1978,1979,1984,2020,0000,0000,0000,0000,0000,
C..CALIFORNIA
     *   0000,0000,0000,1978,2020,0000,0000,0000,0000,
     *   0000,0000,0000,1978,2020,0000,0000,0000,0000,
     *   0000,0000,0000,0000,1978,1980,1982,2020,0000,
C..HIGH ALT. 49-STATE
     *   1978,1979,1982,2020,0000,0000,0000,0000,0000,
     *   1978,1979,1982,2020,0000,0000,0000,0000,0000,
     *   1978,1979,1984,2020,0000,0000,0000,0000,0000/
C
C
      DATA IGPYR7/
C..LOW ALT. 49-STATE
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
C..CALIFORNIA
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000/
C
C
      DATA IGPYR8/
C..LOW ALT. 49-STATE
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,
     *   1977,2020,0000,0000,0000,0000,0000,0000,0000,
C..CALIFORNIA
     *   1977,1979,1981,2020,0000,0000,0000,0000,0000,
     *   1977,1979,1981,2020,0000,0000,0000,0000,0000,
     *   1977,2020,0000,0000,0000,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,
     *   1977,1979,2020,0000,0000,0000,0000,0000,0000,
     *   1977,2020,0000,0000,0000,0000,0000,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 17
C
      COMMON/ISPCOM/ISPYRS(18,3,3),ISPYR8(18,3,3)
C
C..ISPYRS ( IG, IR, IV )
C..ISPYR8 ( IG, IR, IV )
C
      DIMENSION
     *   ISPYR1(18,3),
     *   ISPYR2(18,3),
     *   ISPYR3(18,3)
C
      EQUIVALENCE
     *(ISPYRS(1,1,1),ISPYR1(1,1)),
     *(ISPYRS(1,1,2),ISPYR2(1,1)),
     *(ISPYRS(1,1,3),ISPYR3(1,1))
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR SPEED CORRECTION FACTOR COEFFS
C     LDGV
      DATA ISPYR1/
C..LOW ALT. 49-STATE
     *   0000,1967,0000,1968,1969,1970,1971,0000,0000,0000,
     *   0000,0000,0000,1972,0000,0000,1974,2020,
C..CALIFORNIA
     *   0000,1965,1967,1968,1969,1970,1971,0000,0000,0000,
     *   0000,0000,1972,0000,0000,1974,0000,2020,
C..HIGH ALT. 49-STATE
     *   1967,0000,0000,0000,0000,0000,0000,1968,1969,1970,
     *   1971,1972,0000,0000,1974,0000,0000,2020/
C
C     LDGT1
      DATA ISPYR2/
C..LOW ALT. 49-STATE
     *   0000,1967,0000,1968,1969,1970,1971,0000,0000,0000,
     *   0000,0000,0000,1972,0000,0000,1974,2020,
C..CALIFORNIA
     *   0000,1965,1967,1968,1969,1970,1971,0000,0000,0000,
     *   0000,0000,1972,0000,0000,1974,0000,2020,
C..HIGH ALT. 49-STATE
     *   1967,0000,0000,0000,0000,0000,0000,1968,1969,1970,
     *   1971,1972,0000,0000,1974,0000,0000,2020/
C
C     LDGT2
      DATA ISPYR3/
C..LOW ALT. 49-STATE
     *   0000,1969,0000,0000,1973,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,1978,2020,
C..CALIFORNIA
     *   0000,1968,1971,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,1972,0000,1977,0000,2020,
C..HIGH ALT. 49-STATE
     *   1969,0000,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,1973,0000,0000,1978,0000,0000,2020/
C
C     MC
      DATA ISPYR8/
```

```
C..HC
C..LOW ALT. 49-STATE
     *   0000,1977,0000,0000,1979,0000,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,
C..CALIFORNIA
     *   0000,1977,0000,0000,1979,0000,1981,0000,0000,0000,
     *   0000,0000,0000,2020,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   1977,0000,0000,0000,0000,0000,0000,0000,1979,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,
C..CO
C..LOW ALT. 49-STATE
     *   0000,1977,0000,0000,1979,0000,2020,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,
C..CALIFORNIA
     *   0000,1977,0000,0000,1979,0000,1981,0000,0000,0000,
     *   0000,0000,0000,2020,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   1977,0000,0000,0000,0000,0000,0000,0000,1979,0000,
     *   2020,0000,0000,0000,0000,0000,0000,0000,
C..NOX
C..LOW ALT. 49-STATE
     *   0000,1977,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,2020,0000,0000,0000,0000,
C..CALIFORNIA
     *   0000,1977,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,2020,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *   1977,0000,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,2020,0000,0000,0000,0000,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 18
C
C
C..ACEQIP (         IGEPTR, IVP, IR )
C..ACCF   ( IC, IP, IGUPTR, IVP, IR ) : IC=COEF. #
C..XLCF   (     IP, IGLPTR, IVP, IR )
C..TWCF   (     IP, IGTPTR, IVP, IR )
C
C
      COMMON/ALUCOM/ACEQIP(8,3,3),ACCF(2,3,2,3,3)
      COMMON/ALUCOM/XLCF(3,6,3,3),TWCF(3,6,3,3)
C
C
      DIMENSION XLCF1(3,6,3),XLCF2(3,6,3),XLCF3(3,6,3)
      EQUIVALENCE
     *   (XLCF(1,1,1,1),XLCF1(1,1,1)),
     *   (XLCF(1,1,1,2),XLCF2(1,1,1)),
     *   (XLCF(1,1,1,3),XLCF3(1,1,1))
C
C
      DIMENSION TWCF1(3,6,3),TWCF2(3,6,3),TWCF3(3,6,3)
      EQUIVALENCE
     *   (TWCF(1,1,1,1),TWCF1(1,1,1)),
     *   (TWCF(1,1,1,2),TWCF2(1,1,1)),
     *   (TWCF(1,1,1,3),TWCF3(1,1,1))
C
C..FRACTION OF VEHICLES EQUIPED WITH A/C
      DATA ACEQIP/
C..LOW ALT. 49-STATE
     *   .07,  .14,  .24,  .37,  .51,  .61,  .72,  0.0,
     *   .32,  .52,  .39,  0.0,  0.0,  0.0,  0.0,  0.0,
     *   .32,  .52,  .39,  0.0,  0.0,  0.0,  0.0,  0.0,
C..CALIFORNIA
     *   .07,  .14,  .24,  .37,  .51,  .61,  .72,  0.0,
     *   .32,  .52,  .39,  0.0,  0.0,  0.0,  0.0,  0.0,
     *   .32,  .52,  .39,  0.0,  0.0,  0.0,  0.0,  0.0,
C..HIGH ALT. 49-STATE
     *   .07,  .14,  .24,  .37,  .51,  .61,  .72,  0.0,
     *   .32,  .52,  .39,  0.0,  0.0,  0.0,  0.0,  0.0,
     *   .32,  .52,  .39,  0.0,  0.0,  0.0,  0.0,  0.0/
C
C..A/C CORRECTION FACTOR
      DATA ACCF/
C..LOW ALT. 49-STATE
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
C..CALIFORNIA
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
C..HIGH ALT. 49-STATE
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3,
     * 1.0230E+0, 0.3344E-2, 1.2020E+0, 0.1808E-2, 1.2990E+0, 0.5643E-4,
     * 1.0000E+0, 0.3512E-2, 1.1300E+0, 0.1528E-2, 1.2210E+0, 0.4262E-3/
C
C..EXTRA LOAD C.F.
C..       HC      CO       NOX
C..LOW ALT. 49-STATE
      DATA XLCF1/
C..LDGV
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0852, 1.2478, 1.0313,
     *   1.0556, 1.1347, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
C..LDGT1
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0852, 1.2478, 1.0313,
     *   1.0556, 1.1347, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
C..LDGT2
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
     *   0.0000, 0.0000, 0.0000,
     *   0.0000, 0.0000, 0.0000/
C
C..CALIFORNIA
      DATA XLCF2/
C..LDGV
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0852, 1.2478, 1.0313,
     *   1.0852, 1.2478, 1.0753,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
C..LDGT1
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0852, 1.2478, 1.0313,
     *   1.0852, 1.2478, 1.0753,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
C..LDGT2
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0556, 1.1347, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
     *   0.0000, 0.0000, 0.0000/
```

```
C
C..HIGH ALT. 49-STATE
      DATA XLCF3/
C..LDGV
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0852, 1.2478, 1.0313,
     *   1.0556, 1.1347, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
C..LDGT1
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0852, 1.2478, 1.0313,
     *   1.0556, 1.1347, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
C..LDGT2
     *   1.0786, 1.2765, 0.9535,
     *   1.0495, 1.1384, 1.0313,
     *   1.0556, 1.1347, 1.0753,
     *   1.0455, 1.3058, 1.0719,
     *   0.0000, 0.0000, 0.0000,
     *   0.0000, 0.0000, 0.0000/
C
C
C..TRAILER TOWING C.F.
C..       HC      CO      NOX
C..LOW ALT. 49-STATE
      DATA TWCF1/
C..LDGV
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.4598, 2.4753, 1.1384,
     *   1.7288, 2.1414, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
C..LDGT1
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.4598, 2.4753, 1.1384,
     *   1.7288, 2.1414, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
C..LDGT2
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
     *   0.0000, 0.0000, 0.0000,
     *   0.0000, 0.0000, 0.0000/
C
C..CALIFORNIA
      DATA TWCF2/
C..LDGV
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.4598, 2.4753, 1.1384,
     *   1.4598, 2.4753, 1.2170,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
C..LDGT1
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.4598, 2.4753, 1.1384,
     *   1.4598, 2.4753, 1.2170,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
C..LDGT2
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.7288, 2.1414, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
     *   0.0000, 0.0000, 0.0000/
C
C..HIGH ALT. 49-STATE
      DATA TWCF3/
C..LDGV
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.4598, 2.4753, 1.1384,
     *   1.7288, 2.1414, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
C..LDGT1
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.4598, 2.4753, 1.1384,
     *   1.7288, 2.1414, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
C..LDGT2
     *   1.2614, 1.9327, 1.1184,
     *   1.2762, 1.8940, 1.1384,
     *   1.7288, 2.1414, 1.2170,
     *   1.5909, 3.9722, 1.3875,
     *   0.0000, 0.0000, 0.0000,
     *   0.0000, 0.0000, 0.0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 19
C
      COMMON/ALUPTR/IGEYRS(8,3,3),IGUYRS(2,3,3)
      COMMON/ALUPTR/IGLYRS(6,3,3),IGTYRS(6,3,3)
C
C..IGEYRS ( IG, IVP, IR )
C..IGUYRS ( IG, IVP, IR )
C..IGLYRS ( IG, IVP, IR )
C..IGTYRS ( IG, IVP, IR )
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR A/C EQUIPED
C..A/C EQUIPED
      DATA IGEYRS/
C..LOW ALT. 49-STATE
     *    1961,1964,1966,1968,1971,1976,2020,0000,
     *    1976,1977,2020,0000,0000,0000,0000,0000,
     *    1976,1977,2020,0000,0000,0000,0000,0000,
C..CALIFORNIA
     *    1961,1964,1966,1968,1971,1976,2020,0000,
     *    1976,1977,2020,0000,0000,0000,0000,0000,
     *    1976,1977,2020,0000,0000,0000,0000,0000,
C..HIGH ALT. 49-STATE
     *    1961,1964,1966,1968,1971,1976,2020,0000,
     *    1976,1977,2020,0000,0000,0000,0000,0000,
     *    1976,1977,2020,0000,0000,0000,0000,0000/
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR
C..A/C CORRECTION FACTOR
      DATA IGUYRS/
C..LOW ALT. 49-STATE
     *    1974,2020,
     *    1974,2020,
     *    1978,2020,
C..CALIFORNIA
     *    1974,2020,
     *    1974,2020,
     *    1977,2020,
C..HIGH ALT. 49-STATE
     *    1974,2020,
     *    1974,2020,
     *    1978,2020/
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR
C..EXTRA LOAD C.F.
      DATA IGLYRS/
C..LOW ALT. 49-STATE
     *    1967,1969,1971,1972,1974,2020,
     *    1967,1969,1971,1972,1974,2020,
     *    1969,1973,1978,2020,0000,0000,
C..CALIFORNIA
     *    1965,1969,1970,1971,1974,2020,
     *    1965,1969,1970,1971,1974,2020,
     *    1968,1971,1972,1977,2020,0000,
C..HIGH ALT. 49-STATE
     *    1967,1969,1971,1972,1974,2020,
     *    1967,1969,1971,1972,1974,2020,
     *    1969,1973,1978,2020,0000,0000/
C
C..LAST YEAR OF MODEL YEAR GROUPS FOR
C..TRAILER TOWING C.F.
      DATA IGTYRS/
C..LOW ALT. 49-STATE
     *    1967,1969,1971,1972,1974,2020,
     *    1967,1969,1971,1972,1974,2020,
     *    1969,1973,1978,2020,0000,0000,
C..CALIFORNIA
     *    1965,1969,1970,1971,1974,2020,
     *    1965,1969,1970,1971,1974,2020,
     *    1968,1971,1972,1977,2020,0000,
C..HIGH ALT. 49-STATE
     *    1967,1969,1971,1972,1974,2020,
     *    1967,1969,1971,1972,1974,2020,
     *    1969,1973,1978,2020,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 20
C
       COMMON/GSFCOM/MAXGSF,GSF(18,8,3),IGSFYR(18,8,3)
C
C..GSF    ( IGSFPT, IV, IR )
C..IGSFYR (     IG, IV, IR )
C
C
       DIMENSION
     *   GSF1(18,8),
     *   GSF2(18,8),
     *   GSF3(18,8),
     *   IGSFY1(18,8),
     *   IGSFY2(18,8),
     *   IGSFY3(18,8)
C
       EQUIVALENCE
     *   (GSF(1,1,1),GSF1(1,1)),
     *   (GSF(1,1,2),GSF2(1,1)),
     *   (GSF(1,1,3),GSF3(1,1)),
     *   (IGSFYR(1,1,1),IGSFY1(1,1)),
     *   (IGSFYR(1,1,2),IGSFY2(1,1)),
     *   (IGSFYR(1,1,3),IGSFY3(1,1))
C
C
C
       DATA MAXGSF/18/
C
C
C..GASOLINE (OR DIESEL) SALES FRACTION OF TOTAL FLEET SALES
C
C..LOW ALT. 49-STATE
       DATA GSF1/
C..LDGV
     *   1.000,0.998,0.997,0.995,0.991,0.972,0.966,0.953,0.925,
     *   0.911,0.905,0.886,0.862,0.835,0.824,0.813,0.803,0.800,
C..LDGT1
     *   1.000,0.991,0.972,0.966,0.953,0.925,0.911,0.905,0.886,
     *   0.862,0.835,0.824,0.813,0.803,0.800,0.000,0.000,0.000,
C..LDGT2
     *   1.000,0.991,0.972,0.966,0.953,0.925,0.911,0.905,0.886,
     *   0.862,0.835,0.824,0.813,0.803,0.800,0.000,0.000,0.000,
C..HDGV
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
C..LDDV
     *   0.000,0.002,0.003,0.005,0.009,0.028,0.034,0.047,0.075,
     *   0.089,0.095,0.114,0.138,0.165,0.176,0.187,0.197,0.200,
C..LDDT
     *   0.000,0.009,0.028,0.034,0.047,0.075,0.089,0.095,0.114,
     *   0.138,0.165,0.176,0.187,0.197,0.200,0.000,0.000,0.000,
C..HDDV
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
C..MC
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000/
C
C..CALIFORNIA
      DATA GSF2/
C..LDGV
     *   1.000,0.998,0.997,0.995,0.991,0.972,0.966,0.953,0.925,
     *   0.911,0.905,0.886,0.862,0.835,0.824,0.813,0.803,0.800,
C..LDGT1
     *   1.000,0.991,0.972,0.966,0.953,0.925,0.911,0.905,0.886,
     *   0.862,0.835,0.824,0.813,0.803,0.800,0.000,0.000,0.000,
C..LDGT2
     *   1.000,0.991,0.972,0.966,0.953,0.925,0.911,0.905,0.886,
     *   0.862,0.835,0.824,0.813,0.803,0.800,0.000,0.000,0.000,
C..HDGV
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
C..LDDV
     *   0.000,0.002,0.003,0.005,0.009,0.028,0.034,0.047,0.075,
     *   0.089,0.095,0.114,0.138,0.165,0.176,0.187,0.197,0.200,
C..LDDT
     *   0.000,0.009,0.028,0.034,0.047,0.075,0.089,0.095,0.114,
     *   0.138,0.165,0.176,0.187,0.197,0.200,0.000,0.000,0.000,
C..HDDV
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
C..MC
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000/
C
C..HIGH ALT. 49-STATE
      DATA GSF3/
C..LDGV
     *   1.000,0.998,0.997,0.995,0.991,0.972,0.966,0.953,0.925,
     *   0.911,0.905,0.886,0.862,0.835,0.824,0.813,0.803,0.800,
C..LDGT1
     *   1.000,0.991,0.972,0.966,0.953,0.925,0.911,0.905,0.886,
     *   0.862,0.835,0.824,0.813,0.803,0.800,0.000,0.000,0.000,
C..LDGT2
     *   1.000,0.991,0.972,0.966,0.953,0.925,0.911,0.905,0.886,
     *   0.862,0.835,0.824,0.813,0.803,0.800,0.000,0.000,0.000,
C..HDGV
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
C..LDDV
     *   0.000,0.002,0.003,0.005,0.009,0.028,0.034,0.047,0.075,
     *   0.089,0.095,0.114,0.138,0.165,0.176,0.187,0.197,0.200,
C..LDDT
     *   0.000,0.009,0.028,0.034,0.047,0.075,0.089,0.095,0.114,
     *   0.138,0.165,0.176,0.187,0.197,0.200,0.000,0.000,0.000,
C..HDDV
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
C..MC
     *   1.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,
     *   0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000,0.000/
C
C
C..LAST YEAR OF MODEL YEAR GROUPS
```

```
C
C..LOW ALT. 49-STATE
      DATA IGSFY1/
C..LDGV
     *   1974,1975,1976,1977,1978,1979,1980,1981,1982,
     *   1983,1984,1985,1986,1987,1988,1989,1990,2020,
C..LDGT1
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..LDGT2
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..HDGV
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000,
C..LDDV
     *   1974,1975,1976,1977,1978,1979,1980,1981,1982,
     *   1983,1984,1985,1986,1987,1988,1989,1990,2020,
C..LDDT
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..HDDV
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000,
C..MC
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000/
C
C..CALIFORNIA
      DATA IGSFY2/
C..LDGV
     *   1974,1975,1976,1977,1978,1979,1980,1981,1982,
     *   1983,1984,1985,1986,1987,1988,1989,1990,2020,
C..LDGT1
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..LDGT2
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..HDGV
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000,
C..LDDV
     *   1974,1975,1976,1977,1978,1979,1980,1981,1982,
     *   1983,1984,1985,1986,1987,1988,1989,1990,2020,
C..LDDT
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..HDDV
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000,
C..MC
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000/
C
C..HIGH ALT. 49-STATE
      DATA IGSFY3/
C..LDGV
```

```
     *   1974,1975,1976,1977,1978,1979,1980,1981,1982,
     *   1983,1984,1985,1986,1987,1988,1989,1990,2020,
C..LDGT1
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..LDGT2
     *   1977,1978,1979,1980,1981,1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..HDGV
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000,
C..LDDV
     *   1974,1975,1976,1977,1978,1979,1980,1981,1982,
     *   1983,1984,1985,1986,1987,1988,1989,1990,2020,
C..LDDT
     *   1977,1978,1979,1980,1981.1982,1983,1984,1985,
     *   1986,1987,1988,1989,1990,2020,0000,0000,0000,
C..HDDV
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000,
C..MC
     *   2020,0000,0000,0000,0000,0000,0000,0000,0000,
     *   0000,0000,0000,0000,0000,0000,0000,0000,0000/
C
      END
      BLOCK DATA
C
C..BLOCK DATA SUBPROGRAM 21
C
      COMMON/IOUCOM/IOUIMD,IOUGEN,IOUREP,IOUERR,IOUASK,IOUUNF
C
C..UNIT#   USAGE   DESCRIPTION
C..------  ------  -----------
C..IOUIMD  INPUT   USER SUPPLIED I/M PCIM DATA (WHEN IMFLG=2)
C..IOUGEN  INPUT   USER SUPPLIED GENERAL INPUT DATA
C..IOUREP  OUTPUT  FORMATTED REPORT FILE
C..IOUERR  OUTPUT  ERROR/WARNING MESSAGES FILE
C..IOUASK  OUTPUT  PROMPTING MESSAGES FILE
C..IOUUNF  OUTPUT  UNFORMATTED REPORT FILE (WHEN IMPLEMENTED)
C
C
C
      DATA IOUIMD/4/
C
      DATA IOUGEN/5/
C
      DATA IOUREP/6/
C
      DATA IOUERR/6/
C
      DATA IOUASK/6/
C
      DATA IOUUNF/9/
C
      END
```

APPENDIX C

USER INFORMATION AND PROGRAM ERRATA

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C.0 INTRODUCTION

This appendix contains information that may be useful to MOBILE2 users. This appendix will be periodically updated; as program errors become known, as omissions or errors in the User's Guide are noted, or as advice for special MOBILE2 applications is requested. This information will be given only when unavailable in the existing MOBILE2 documentation (User's Guide to MOBILE2, Compilation of Air Pollutant Emission Factors: Highway Mobile Sources, Derivation of the Highway Mobile Source Emission Factors).

C.1 ERRATA

This section describes any known problems or errors in the MOBILE2 source code, and any omissions or errors in the User's Guide to MOBILE2.

C.1.1 Speed Correction Factor

Introduction

Since the October, 1980 release of MOBILE2, several users have contacted EPA regional offices with the same question regarding emissions predicted at 100% cold start, 100% hot start, or 100% stabilized operating conditions. Each user had run several identical input scenarios through MOBILE2, except that the operating mode percentages were varied from 100% cold start to 100% hot start to 100% hot stabilized. The users were surprised that the 100% hot start emission levels are often less than the 100% stabilized emission levels; and occasionally even the 100% cold start emissions are less than the 100% stabilized emissions.

The problem occurs because MOBILE2 implicitly alters the user's input speed to reflect the differences in the speeds represented in the start-up and the stabilized portions of the Federal Test Procedure (FTP). This is explained in detail in the subsequent sections. The problem as described below has been resolved and requires minor program modifications.

Brief Statement of Problem

MOBILE2 sometimes adjusts non-HDV emissions for speed inappropriately when scenarios have other than the standard (FTP) VMT percentages in each operating mode; i.e., other than 20.6% cold start; 27.3% hot start, 52.1% stabilized. Because of this, the basic emission levels calculated by MOBILE2 under non-standard operating mode fractions represent emissions at a speed usually different from the speed given on the input scenario record.

Throughout the remainder of this section, "emission levels" refer to non-HDV emission levels. MOBILE2 handles speed corrections for HDGV and HDDV accurately.

If the user's cold start operation percentage and hot start operation percentage sum to 47.9%, as in the basic test procedure, MOBILE2 will calculate emissions at the given input speed.

If the users cold start operation percentage and hot start operation percentage sum to greater than 47.9%, MOBILE2 generally underestimates emissions for the given input speed. In this situation, the emission rates generated by MOBILE2 represent emissions rates at some speed greater than the speed input on the scenario record.

If the users cold start operation percentage and hot start operation percentage sum to less than 47.9%, MOBILE2 generally overestimates emissions for the input speed. The emissions generated by MOBILE2 in this situation represent emission rates at some speed less than the user's input speed.

Examples

The following three examples illustrate the problems raised above. The statements regarding emission levels are generally true for HC and CO and are reversed for NOx.

(1) The emissions calculated under a scenario with 19.6 mph and 100% cold start VMT actually represent cold start emissions at 26 mph. The cold start emission levels at 19.6 mph would generally be higher. This is also true for 100% hot start VMT.

(2) The emissions calculated under a scenario with 19.6 mph and 100% stabilized VMT actually represent stabilized emissions at 16 mph. The stabilized emission levels at 19.6 mph would generally be lower.

(3) The emission levels calculated under a scenario with 19.6 mph, 30% cold start VMT, 30% hot start VMT, and 40% stabilized VMT actually represent emissions at 20.8 mph. The emission rates for 19.6 mph would generally be higher.

Because of (1) and (2) above, users sometimes see 100% VMT cold or hot start emissions that are less than 100% VMT stabilized emissions, though they input the same speed on the scenario records.

Detailed Explanation of Problem

The basic test procedure (FTP) for light duty vehicles and trucks is a three-part test sequence. The first part consists of operating the vehicle in a cold start condition through a predetermined cycle which has an average speed of 26 mph. In the second part, the vehicle operates in a stabilized condition through a (different) cycle which has an average speed of 16 mph. The third part is a repeat of the first, except the vehicle is operated in a hot start condition. Emissions are collected during each of the three operating modes and emission levels (grams/mile) are determined for each test segment. The emission levels are combined and basic exhaust emission levels are determined by weighting the cold start level by .206, the stabilized level by .521, and the hot start level by .273. The average speed for the entire cycle using these weighting factors is 19.6 mph.

The Ripstwxn equation is used to adjust the basic exhaust emission levels for the user's speed, temperature, and operating mode percentages. The equation follows:

$$\text{Ripstwxn} = \text{SCF}(S) * \text{SUM}_{b=1 \text{ to } 3} [\text{WEIGHT}_b * \text{TCF}_b(t) * (B_b+D_bM)/([B_o+D_oM)]$$

where:

b = Test segment: 1 = cold start, 2 = stabilized, 3 = hot start.

S = The speed from the scenario record.

SCF(S) = The multiplicative speed correction factor to adjust the emission rate from the basic speed of 19.6 mph to the user's speed S (from the scenario record).

WEIGHT_b = The fraction of VMT accumulated in test segment b.

$\text{TCF}_b(t)$ = Temperature correction factor for test segment b, temperature t.

B_b, D_b = Normalized bag fraction, test segment b.

B_o, D_o = Normalized bag fraction, entire test.

As can be seen from the Ripstwxn equation, the program takes a portion of each test segment (the 26 mph cold start (CS), the 16 mph stabilized (STAB), and the 26 mph hot start (HS)) and adds them to determine the adjustment to the overall emission level. When the user inputs the basic test procedure VMT percentages of 20.6% CS, 27.3% HS, and 52.1% STAB; this summed factor represents a correction to the emission level at 19.6 mph, adjusting for temperature and operating mode VMT fractions. The speed correction factor term SCF(S) then adjusts the emission rate from the basic test speed of 19.6 to the user's speed S. (If the user's input speed is 19.6 mph, no adjustment is made, since SCF(19.6)=1).

The problem is that if the user's VMT percentages are different from 20.6% CS/27.3% HS/52.1% STAB, then the $\text{SUM}[\text{WEIGHT}_b*\ldots]$ term represents an emission correction from a speed different from 19.6 mph. This is because the user is selecting different portions of the 26 and 16 mph segments of the test.

For example, VMT percentages of 30% CS/30% HS/40% STAB represent 30% VMT being driven at 26 mph, another 30% VMT being driven at 26 mph, and 40% VMT being driven at 16 mph; which will provide an average speed of 20.8 mph. In this case the speed correction factor term SCF(S) should adjust the emissions from 20.8 mph to the user's speed S, since the $\text{SUM}[\text{WEIGHT}_b*\ldots]$ term contains an implicit correction from 19.6 mph to 20.8 mph. Unfortunately, SCF(S) only represents an adjustment from 19.6 mph to S, since the speed adjustment term does not take the VMT weights into account and assumes the $\text{SUM}[\text{WEIGHT}_b*\ldots]$ term always represents a correction to emissions at 19.6 mph.

Resolution of Problem

The resolution of this predicament is to replace the speed correction term SCF(S) by a new speed correction term SCF'(SADJ, S), where "SADJ" is the average speed represented in the $SUM[WEIGHT_b*...]$ term, and SCF'(SADJ, S) represents the adjustment to the emission levels from speed SADJ to speed S (where SCF'(19.6,S) = SCF(S)).

The speed SADJ can be calculated by:

$$1/SADJ = WEIGHT_1/26 + WEIGHT_2/16 + WEIGHT_3/26$$

By the methodology under which the speed correction factor was derived, it turns out that

$$SCF'(SADJ,S) = SCF(S)/SCF(SADJ)$$

This equation, fortunately, necessitates minimal program change since the old speed correction factor equation and coefficients are still usable.

Specific Program Changes

The coding changes required to implement this change are restricted to subroutine BIGCFX. The two changes, as previously mentioned, are as follows:

1. To calculate the speed SADJ represented in the $SUM[WEIGHT_b*...]$ emission level correction term. This variable is called SADJ in BIGCFX.

2. To modify the Ripstwxn correction factor equation to replace SCF(S) by SCF(S)/SCF(SADJ). The variable is named SCFADJ in BIGCFX and it represents the SCF(SADJ) term.

See subroutine BIGCPX in Appendix B. Revision bars indicate the portions of the program which have changed. There are further program changes that can be made to improve the efficiency of the speed correction factor calculations. This involves changes to subroutine SPFCLX and BIGCFX. The changes are:

1. SPFCLX calculates speed correction factors for every combination of 18 groups, 3 pollutants, and 8 vehicle types; and stores these factors in array SPBACK. Only 4 of the vehicle types from SPBACK (LDGV, LDGT1, LDGT2, MC) are used. The DO-LOOP over 8 vehicle types can be modified to bypass the calculations for 4 vehicle types not used.

2. Since only 4 of the 8 vehicle types in the SPBACK array are used, the dimension of SPBACK can be changed from (18,3,8) to 18,3,4). This would impact both BIGCFX and SPFCLX. BIGCFX would then have to index into SPBACK with the values (IS, IP, IVA) rather than (IS, IP, IV).

C.1.2 Compilation of Equivalence Statements

Some users have had problems compiling some of the EQUIVALENCE statements in routines INPUT, BLOCK DATA 3, and BLOCK DATA 4. Their compilers generate a message like "VARIABLES WITHIN SAME COMMON BLOCK EQUIVALENCED." The messages refer to the equivalenceing of array IOUOLD in INPUT, array INDXYR in BLOCK DATA 3, array BASE3R in BLOCK DATA 4, and array DEL3R in BLOCK DATA 4.

The problem is that an array is locally defined in the routine, and different portions of the array are equivalenced to different variables within the <u>same</u> common area.

For example, in BLOCK DATA 4, a local array BASE3R is dimensioned (15,3,8,3). Three smaller arrays BASE49, BASECA, and BASEHI are dimensioned (15,3,8); these three arrays are in the COMMON area BASECM.

EQUIVALENCE statements then equate the first 1/3 of BASE3R with array BASE49, the second 1/3 of BASE3R with array BASECA, and the last 1/3 of BASE3R with array BASEHI.

The arrays BASE49, BASECA, and BASEHI are adjacent within a common area, and so in contiguous memory. Since the first element of BASE3R is equivalenced to BASE49, the arrays BASECA and BASEHI are automatically equivalenced to portions of the BASE3R array. Any subsequent explicit equivalences between BASECA and BASE3R could represent a conflict with the previous implict equivalence. Some compilers will complain about any semblence of a conflict, even when the equivalenceing works out right, and the subsequent eqivalences are merely redundant.

The solution to this problem, if the users compiler indicates a problem, is this:

1. In routine INPUT, change the statement

   ```
   EQUIVALENCE (IOUOLD(1), IOUREP),
   *           (IOUOLD(2), IOUERR),
   *           (IOUOLD(3), IOUASK),
   *           (IOUOLD(4), IOUUNF),
   ```

   to

   ```
   EQUIVALENCE (IOUOLD(1), IOUREP)
   ```

2. In Block Data 3, change the statement COMMON/INDXCM/INDX49, INDXCA, INDXHI to

   ```
   COMMON/INDXCM/INDXYR
   ```

3. In Block Data 4, change the statements

   ```
   COMMON/BASECM/BASE49,BASECA, BASEHI
   COMMON/DELCOM/DEL49, DELCA, DELHI
   ```

to

```
COMMON/BASECM/BASE3R
COMMON/DELCOM/DEL3R
```

C.1.3 Erroneous Comment Statement

In BLOCK DATA 17, the comment statement

```
c...ISPPT8 (IG, IR, IV)
```

should be changed to

```
c...ISPPT8 (IG, IR, IP)
```

C.2 USER INFORMATION

This section gives information, requested by users, concerning the application of MOBILE2 for special analysis. At this time, no such information is available.